KD11-K

KD11-K MICRODIAGNOSTIC

MD-11-DQKUB-B

EP-DQKUB-B-DL-A

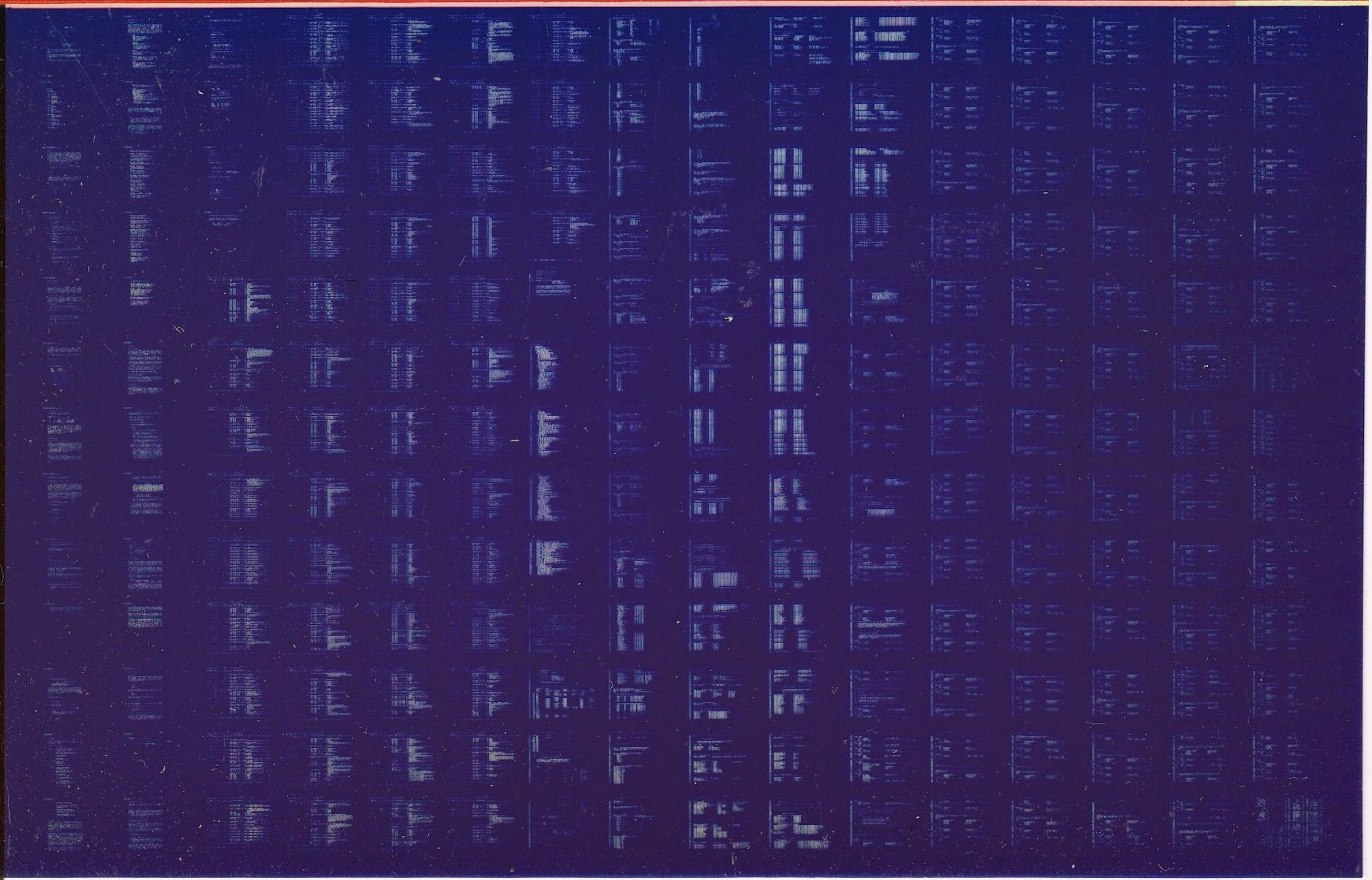
COPYRIGHT © 1977

FICHE 1 OF 3

AUG 1977

digital

MADE IN USA



KD11-K

KD11-K MICRODIAGNOSTIC

MD-11-DQKUB-B

EP-DQKUB-B-DL-A

COPYRIGHT © 1977

FICHE 2 OF 3

AUG 1977

digital

MADE IN USA

KD11-K

KD11-K MICRODIAGNOSTIC

MD-11-DQKUB-B

EP-DQKUB-B-DL-A

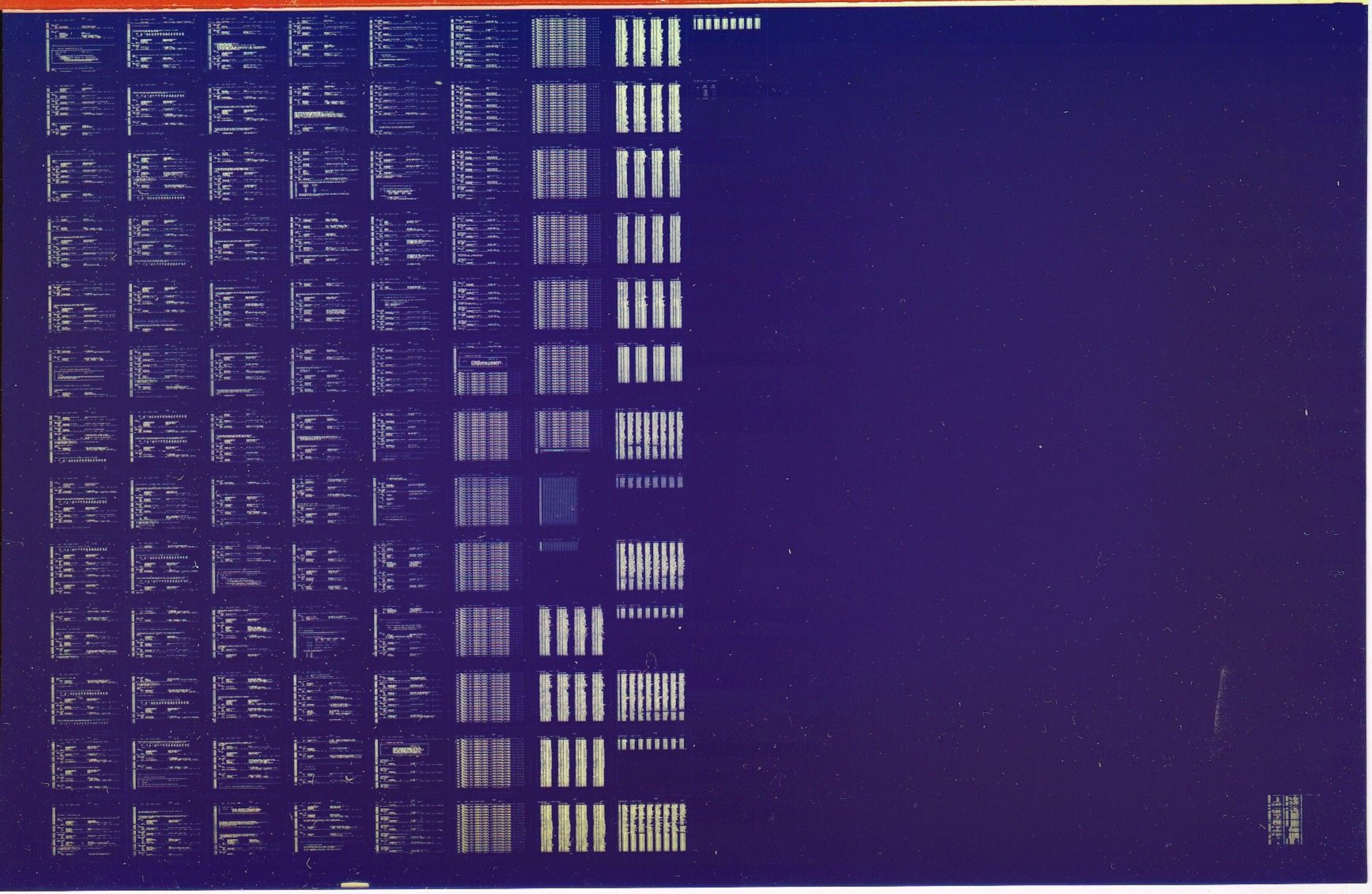
COPYRIGHT © 1977

FICHE 3 OF 3

AUG 1977

digital

MADE IN USA



I D E N T I F I C A T I O N

PRODUCT CODE: MAINDEC-11-DQKUB-B-D
VERSION /101/

PRODUCT NAME: KD11-K Microdiagnostic

MAINTAINER: Diagnostic Engineering

AUTHOR: Don North

DATE CREATED: 18-Jan-1977

LAST REVISION: 22-Jun-1977

COPYRIGHT (C) 1977; Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts, USA
01754 617-897-5111

This software is furnished to the purchaser under a license for use on a single computer system, and can be copied (with inclusion of DIGITAL's copyright notice) only for use in such system, except as may otherwise be provided in writing by DIGITAL.

The information in this document is subject to change without notice, and should not be construed as a commitment by DIGITAL EQUIPMENT CORPORATION. DIGITAL EQUIPMENT CORPORATION assumes no responsibility for any errors that may appear in this document.

DIGITAL assumes no responsibility for the use or reliability of its software on equipment not supplied by DIGITAL.

- TABLE OF CONTENTS -

1.0 ABSTRACT

2.0 REQUIREMENTS
- 2.1 Hardware
- 2.2 Documentation / Listings

3.0 LOADING PROCEDURE

4.0 STARTING PROCEDURE
- 4.1 Operator's Console
- 4.2 DCS Switches
- 4.3 Console "INIT"

5.0 OPERATING PROCEDURE
- 5.1 DCS Indications While Executing
- 5.2 DCS Execution Time
- 5.3 DCS 'End of Pass' and 'Error' Indications

6.0 RESTRICTIONS
- 6.1 Hardware
- 6.2 Software

7.0 TEST DESCRIPTION
- 7.1 Test Structure
- 7.2 DCS Microcode Conventions
- 7.3 What is/is-not tested
- 7.4 Global Test Order

8.0 ERROR HANDLING
- 8.1 What is an 'ERROR' ?
- 8.2 'FAULT DIRECTORY' Format and Use
- 8.3 'SCOPE Loop' Facility

9.0 REVISION HISTORY
- 9.1 Revision Number
- 9.2 Revisions to DCS Code

10.0 DCS VERIFICATION / SELF TEST
- 10.1 Requirements
- 10.2 Method / Algorithm
- 10.3 Procedure and Indications

11.0 MISCELLANEOUS
- 11.1 ACT/APT/XXDP
- 11.2 Macro Instruction Interface

1.0 ABSTRACT

The 'DCS' (Diagnostic Control Store) Module is a diagnostic tool specifically designed for the PDP-11/60 [KD11-K] Central Processor. Functioning as an alternate 2048 word control store, microcoded tests are executed to detect and isolate errors within the internals of the processor control and datapath hardware. Error indication information is provided by the DCS module; coupled with an indexed FAULT DIRECTORY, errors are resolved to the module level, when possible. Additional information is also provided resolving the error to a specific functional logic block. Significant benefits of this micro diagnostic approach are seen to be:

- Memory/I-O Device/UNIBUS independence
- Direct hardware microcontrol and visibility
- Extremely fast load and execution times
- Excellent coverage and resolution

2.0 REQUIREMENTS

A preliminary note:

Throughout this DCS User's Guide, the two terms "FAULT" and "ERROR" have been used interchangably. They both are to indicate "malfunctioning logic elements" (eg, busted IC's) and open/shorted ETCH runs, etc., in the unit under test. No distinction between the two terms is implied.

2.1 Hardware

To use the DCS, the following hardware is required:

1. DCS (Diagnostic Control Store) Module M7871 (KU116-BB)
2. PDP-11/60 [KD11-K] Central Processor
3. DL11-W Line Clock (required)
4. First 4k memory bank (required minimum)

2.2 Documentation / Listings

The available documentation for the DCS module user comprises the following items:

- DCS User's Guide (this document)
- FAULT DIRECTORY Listing; for module replacement information
- DCS Microcode Listing; when IC level debug is necessary
- DCS Maintenance Manual, Print Set; for detailed information on DCS hardware operation
- KD11-K Processor Maintenance Manual, Print Set; for IC level debug, base machine hardware specific information

Specific MAINDEC component part numbers for the DCS documentation are as follows:

MD-11-DQKUB-*-D;
User's Guide, FAULT DIRECTORY (PAPER, 80 pages)

MD-11-DQKUB-*-LA;
DCS Microcode Listing (PAPER, 450 pages)

MD-11-DQKUB-*-FA;
User's Guide, FAULT DIRECTORY, DCS Microcode Listing (FICHE, 4 cards)

3.0 LOADING PROCEDURE

The DCS occupies slot 1 in the KD11-K processor backplane; thus if an ECS or UCS option is present, it must be removed. To load the DCS, the following sequence should be employed:

1. Power down the CPU
2. Remove the ECS/UCS option from processor slot #1, if present
3. Insert the DCS module into slot #1. Use caution while inserting the DCS module, as a slightly bowed board may require some gentle maneuvering to seat it in place.
4. Orient the DCS 'RUN/STOP' switch to 'STOP', and the 'NORMAL/VERIFY' switch to 'NORMAL'
5. Now power up the CPU

4.0 STARTING PROCEDURE

DCS execution can be initiated by two distinct methods:

4.1 Startup via the Operator's Console (KY11-P)

With the KD11-K CPU in "CONSOLE" ("HALTed") mode, simultaneously depress the KY11-P operator's console "CNTRL/DIAG" keys to start the DCS. (If no DCS/ECS/UCS happens to be present, there should be no effect). Section 5.1 (below) interprets the display on the operator's console while the DCS is executing, and after it stops. If this method fails to start the DCS, proceed to the next paragraph.

4.2 Startup via the DCS Switches

If it is desired for some reason to bypass use of the KY11-P operator's console to initiate the DCS, an alternative means is provided. This method would be used, for example, in the event that starting from the operator's console was not possible (using "CNTRL/DIAG") due to some hardware malfunction. The procedure is:

1. On the DCS module, set the 'NORMAL/VERIFY' switch to 'NORMAL'

2. Now set the 'RUN/STOP' switch (on DCS module also) to the 'RUN' position, or flip it from 'RUN'->'STOP'->'RUN'

The DCS should now assume control of the KD11-K CPU, irregardless of the previous state of the CPU ("CONSOLE", "RUN", or whatever).

NOTE

If the DCS 'RUN/STOP' switch was already in the 'RUN' position, then it is expected that the operator's console keys have no effect - the DCS is already enabled to execute, and is controlling the CPU. The DCS microcode does not monitor the console keypad for operator input.

If neither of the above methods produce a 'RUNNING' indication of the DCS (as per Section 5.1), then proceed to the next paragraph.

4.3 Using Console "INIT"

Set the DCS switches as detailed in Section 4.2 (ie, 'NORMAL' and 'RUN'). Now generate a processor "INIT" signal by simultaneously depressing the "HALT" and "START" keys on the operator's console. This should now initialize the CPU logic and restart the DCS, producing a 'RUNNING' indication (see Section 5.1).

If no 'RUNNING' indication is now present, then a problem exists in the power supply, system clocks, DCS module, or ???.

5.0 OPERATING PROCEDURE

5.1 DCS Indications While Executing

5.1.1 On the KD11-K Operator's Console

While the DCS is executing, the operator's console display should be approximately as follows:

"RUN" - ON Continuously
"PROC" - BLINKing
"USER" - BLINKing
"CONSOLE" - OFF Continuously
"BATTERY" - <indeterminate>

The 6 digit octal display should read:

(0 0 0 0 0 0) - In DCS pass 1;

(.0.0.0.0.0.0.) - In DCS passes 2-64.

If any of the above conditions are not met, then either:

1. The console hardware is inoperable, or
2. The DCS is hung in an 'error/scope loop'

[Not necessarily in that order]

5.1.2 On the DCS Module

On the DCS module, the two important indicators to watch at this time are the 'ERROR' and 'EOP' LEDs:

-----LEDS----- 'ERROR'	'EOP'	State	Comment
OFF	OFF	Probable ERROR	DCS and/or processor HUNG
OFF	ON	* EOP *	Successful EOP
ON	OFF	* ERROR *	Genuine ERROR
ON	ON	Probable ERROR	DCS 'VERIFY MODE' indication

Note the 'Probable ---' notation. Either 'EOP' or 'ERROR' on the DCS should be lit: both OFF or both ON indicate non-standard conditions that require further investigation. Neither 'ERROR' nor 'EOP' indicates that the DCS and/or processor are in a HUNG condition (eg, clocks suppressed); see section 8 (Error Handling). Both 'ERROR' and 'EOP' is the standard DCS 'VERIFY MODE' indication. Make sure the DCS 'NORMAL/VERIFY' switch is set to 'NORMAL' (if this is intended), and then restart the DCS. See section 10 (Verify Mode) for further information.

5.2 DCS Execution Time

The execution time of the DCS will vary depending upon its mode of initiation.

5.2.1 "CNTRL/DIAG" Start From Operator's Console

When started via "CNTRL/DIAG" from the operator's console, and assuming no errors, DCS will execute with console display as detailed above for approximately 6 seconds (64. passes at 100 milliseconds/pass, about 350,000 microcycles/pass). After this time has elapsed, control should return to the KD11-K microcode, as if the CPU had just been powered up with the slide switch set to "HALT". Note that the machine will end up in console mode irregardless of the actual slide switch settings (RUN/BOOT/HALT). Section 5.3 interprets the console and DCS displays after this delay time, for successful 'END-OF-PASS' and 'ERROR' indications.

5.2.2 Start From DCS Switches

When started via setting 'RUN/STOP' to 'RUN' on the DCS module, the DCS will execute continuously, not returning to the KD11-K microcode until the 'RUN/STOP' switch is reset to the 'STOP' position. Throughout this time, the execution indications will be as previously detailed. When the switch is returned to 'STOP', the DCS may execute for a maximum of

approximately 6 more seconds; and then proceed as described directly above, entering "CONSOLE" mode.

5.3 DCS 'END-OF-PASS' and 'ERROR' Indications

5.3.1 On The DCS Module

Successful 'END-OF-PASS' and 'ERROR' conditions detected by the DCS are indicated most directly on the DCS module by the two LEDs labeled 'EOP' and 'ERROR'. 'EOP' is turned on at the end of each successful pass thru the DCS code - assuming 'ERROR' has not yet been turned on. In an error-free running situation, 'EOP' will be on; 'ERROR' off. Note that 'EOP' comes on at the end of the first pass (assuming no errors), and thus will appear to be on continuously.

In the event the DCS detects an error, the 'ERROR' LED will be turned on, and the 'EOP' LED turned off. The 'ERROR' LED will be latched in such a way that it cannot be turned off if the error disappears (i.e., a 'flaky' timing error), thus retaining the indication of an error. See section 8 (Error Handling) for a full treatment of the various error conditions: Detection, Indication, Scope-looping.

5.3.2 On the Operator's Console

Successful 'END-OF-PASS' and 'ERROR' conditions are indicated on the operator's console as follows:

1. A successful 64. passes and return to KD11-K processor microcode control, by a

   (.1.2.3.3.2.1.)

   in the console display, and the KD11-K processor "HALTed" in "CONSOLE" mode.

2. An error in pass 1 will usually (but not always) be indicated by a

   (0 0 0 0 0 0)

   in the console display.

3. An error in pass 2 thru -- will usually (but not always) be indicated by a

   (.0.0.0.0.0.0.)

   in the console display.

Note the qualifications in the previous statements:

For a successful 'END-OF-PASS' and exit back to KD11-K microcode control, only one display is valid:

(.1.2.3.3.2.1.)

For any other display except "(.1.2.3.3.2.1.)", check the DCS module 'EOP' and 'ERROR' LEDs for the most reliable indication of the result of execution.

See Section 8 for a full explanation of error processing.

6.0 RESTRICTIONS

6.1 Hardware

6.1.1 Cache and Memory Management (KT)

The DCS executes with both Cache and KT disabled:

1. Cache, by setting both the "Force Miss" bits
2. KT, by clearing the "Enable" bit

The DCS checks the most basic path from the UNIBUS to/from internal data paths. Further macro diagnostic programs are available for Cache (MD-11-DQKKA-*) and Memory Management (MD-11-DQKTA-*) fault diagnosis.

6.1.2 MOS Memory Battery Backup

The MOS memory battery backup (if present) must either be "Good" or else disabled. Otherwise, the micro diagnostic code WILL NOT execute without detecting an error.

Indications are: ERCD=5621/TNUA=7400, in TEST620C.

6.2 Software

6.2.1 Return To Console / DCS End-of-pass Processing

Console "HALT" mode is the ONLY exit provided from DCS back to base machine microcontrol. This action is due to:

1) The DCS, upon detecting an error, locks itself (and the processor) up in such a way that manual intervention by the operator is required for return to base machine microcontrol.

2) The DCS completely alters the internal microstate of the processor, destroying its previous contents, and leaving "garbage" in its place. Thus the full base machine power-up "INIT" sequence is generated by DCS to "clean-up" the processor prior to returning control.

7.0 TEST DESCRIPTION

7.1 Test Structure

7.1.1 Philosophy

The testing philosophy used in the design of the DCS microcode centers arduhd two major points:

1. Start with as minimal a HARDCORE as possible.
2. Use only TESTED and VERIFIED logic elements to diagnose UNTESTED elements; add TESTED elements to the arsenal of logic available for further testing.

This method of test organization and construction presents the best approach for building a high resolution and high coverage diagnostic program. Section 7.4 (below) summarizes the actual testing order present in the DCS microcode, as designed using the above philosophy. Section 8.1 presents more specific details on the actual method of ERROR detection employed by the DCS microcode and hardware.

7.1.2 Mechanics

The manner in which DCS tests are setup is depicted in the following diagram:

```
          \ /
           .
<setup ENUA/DCS-CNTR as test requires>
           .
           .
<perform the actual test function>
    -may be inline microcode
    -may call subroutine
           .
           .
<jump to BUT area, perform BUT(test) into TARGET>
           .
           .
<enter TARGET area from BUT, ENUA::TNUA compare>
    -the DCS-CNTR was loaded above to enable compare here
    -the ENUA was setup at correct TARGET point
    -exit via BUTA(RETURN)
           .
          \ /
<...next test now begins...>
```

7.2 DCS Microcode Conventions

7.2.1 Microdiagnostic Code Listing Organization

The format of the DCS microcode listing is presented in the following table, along with a brief description of each section (when necessary):

pages	contents
1-5	IDENTIFICATION, TABLE-OF-CONTENTS
6-9	DCS REGISTER LAYOUTS, MICROWORD BIT TABLE a number of graphic tables
10-24	MICROWORD FIELD DEFINITIONS, BASE MACHINE defines U<47:00> and their functions
25-26	DCS FIELD DEFINITIONS defines U<54:48> and their functions
27-37	"SIMPLE" MACROS these macros are combinations of FIELD definitions only
38-52	"ADVANCED" MACROS these macros are combinations of SIMPLE macros
53-380	---DCS-MICRODIAGNOSTIC-TESTS---
381-384	EOP/VERIFY-MODE MICROCODE microcode used in END-OF-PASS and VERIFY-MODE processing
385-393	GENERAL SUBROUTINES, COMMON CODE this section contains some VERY commonly used subroutines
394-395	JAMUPP MICROCODE all JAMUPP conditions enter here ...
396-402	BUT(---) TAKEOFF MICROWORDS most all DCS tests start their microbranch from this list of BUT's
403-417	BUT(---) TARGET MICROWORDS and most all DCS tests end up here, where they compare their ENUA::TNUA in this 256. word table
418	BIT MAP OF DCS ADDRESS SPACE

a BIT MAP of the entire DCS address space, 1=USED, 0=FREE

X1-X10 SYMBOL/LINE-NUMBER/LOCATION CROSS REFERENCE
a very useful reference to find the location in the DCS listing of a particular symbolic label

X11-X18 LOCATION/SYMBOL CROSS REFERENCE
an expansion of the above BIT MAP, substituting the symbolic label for the 1/0's present in the above

X19 FREE/USED LOCATION SUMMARY
a quantitative summary of FREE/USED microlocations, by PAGE and TOTAL

7.3 What is/is-not tested

The DCS micro diagnostic code has been designed to detect and isolate errors within the "internals" of the KD11-K processor hardware. As such, it does not attempt (nor is it possible) to detect certain errors, which are processor related, but require devices external to the processor. Errors related to NPR/BR arbitration sequences, multiple BR priority level interrupt sequences, POWER FAIL / RESTART, etc., are a few of the elements of this general class. The following sections enumerate both classes of logic: TESTED by DCS, and UNTESTABLE by DCS.

7.3.1 TESTED by DCS

Essentially, the DCS is designed to test the "heart" of the KD11-K processor - those elements that must be functional to "bring up" the processor to a level whereupon further macro diagnostic programs could then be loaded and started (ie, M9301-YH boot/diagnostic, processor and peripheral diagnostics, etc.) to successfully isolate more complex processor and system related errors. Processor operation with either KT/KJ or CACHE enabled was not considered as part of this "heart" - as the processor will run perfectly fine without either of these facilities (albeit at a degraded performance level). Thus the DCS is able to concentrate on more thorough coverage and resolution in those portions of the hardware that are least "visible and testable" from a macro diagnostic, and very suitable to micro diagnosis.

Rather than present a full module by module list of which logic the DCS tests, refer to section 7.4 (below), which is an itemized "execution-time" summary of the DCS micro diagnostic tests. The following section lists those areas that the DCS cannot test (ie, uncontrollable or unobservable logic) or

would have required a prohibitive number of microwords to test effectively.

7.3.2 UNTESTABLE by DCS

From a functional point of view, the DCS operates on the KD11-K processor from the "inside out". Both the CACHE and KT/KJ are turned off (disabled); there is no FP11-E HFP unit assumed to be present; likewise no ECS/WCS options. No external I/O options are assumed on the UNIBUS, except the standard DL11-W console interface / line clock. The lowest 4K memory bank is assumed to be present. These restrictions impose constraints on the logic that can be exercised by DCS. The following list attempts to detail as specifically as possible, on a module by module basis, those functional areas of the processor that the DCS cannot fully diagnose:

-K2 UWORD-
- -full effects of processor "INIT"
- -NUA<11> [DCS can't "see" it]
- -CROM contents and address drivers
- -FP11-E related (FLPGO, HFP[CC], etc.)
- -UCON's HFP/KT/WCS
- -HFP FLAG-ROM contents

-K3 IR-DECODE-
- -CROM contents and address drivers
- -CROM extension roms
- -full effects of processor "INIT"
- -full rom contents (location by location) of:
  - -BYTE/CC, INSTR-5, FLTPT, CC[V/C], PS[CC]-BRANCH,
  - -BYTE-DECODE, KT-DECODE roms
- -KT/KJ enable/select logic

-K4 DATAPATH-
- -full processor "INIT" effects
- -data I/O validity in some A/B/C-SPAD locations
- -SP/BY/KT selection
- -CACHE INVALIDATE logic

-K5 CACHE/KT-
- -processor UNIBUS operation with CACHE enabled
- -processor UNIBUS operation with KT/KJ enabled
- -status conditions of above, including
  - -RED/YELLOW ZONE, MM-ABORT, CACHE errors, etc.

-K6 TIMING-
- -ECL clock logic (must be "clocking" ...)
- -74S37 etc CLOCK DRIVERS - mostly HARDCORE
- -MAINTENANCE clock
- -some JAMUPP/PULSE-SUPPRESS conditions (see K7)
- -UNIBUS master arbitration, NPR/BR/PROCESSOR
- -CACHE control (NPR track, HIT, etc.)
  - -remember DCS turns CACHE OFF

```
        -UNIBUS address drivers - full test of same
        -full check of INTRNL-ADDR rom contents
        -full processor "INIT" effects

    -K7 STATUS-
        -full processor "INIT" generation/effects
        -POWER FAIL/RESTART logic
        -BR-4/5/7 requests, BG arbitration
        -SACK timeout (BG/NPR)
        -NPR/NPG logic
        -SERVICE conditions:
          -FP11-E/YELLOW-ZONE/CONSOLE/PWRFAIL/CACHE
        -JAMUPP conditions:
          -KT-ABORT/RED-ZONE/CACHE+MEMORY+WCS-parity-error
        -CONSOLE interface:
          -KEYCODE input/DISPLAY output/LOCAL and REMOTE
          -[see 11/60 microcode listing for "CONSOLE MICRO
            TEST", which tests these functions]
        -STATUS mux bits:
          -bits related to above conditions not asserted
          -BATTERY BACKUP for MOS MEMORY OK
```

7.4 Global Test Order

The following list provides a summary of the major functional blocks of the DCS micro diagnostic code, presented in execution-time order. Note the progression from the innermost portions of the processor logic (microsequencing, IR decode); through the intermediate areas (ALU, SHIFT TREE, etc.); out to the external interface logic (UNIBUS cycles, INTR sequences).

NOTE

Most of the capitalized terms refer to specific hardware elements in the KD11-K processor. No attempt is made to explain their meaning - the unfamiliarized reader is referred to the processor logic block diagrams, print set, maintenance manual, and the micro diagnostic code listing for their definition.

The notation "[xxx/yyy]" signifies the micro tests in the range "TESTxxx" to "TESTyyy". All DCS tests are numbered octally, and are executed in ascending order. Some test numbers are further broken down into "TESTxxxA", "TESTxxxB", etc., when their functions are logically similar. Certain test numbers are non-existent (eg, there are no tests with numbers in the range 200-277).

```
[001/007] - NUA sequencing logic
  -UPF sequencing, page changing
```

[010/011] - microsubroutine operation
  -RETURN register, BUTA(SUBR-B)/BUTA(RETURN) decode

[012A/050B] - IR decode logic and microbranch
  -INSTR -1, -5, -FLTPT decode
  -microbranch selection / execution
  -misc IR decode related microbranch logic
  -processor UCON IR load, EMIT constant generation

[101] - D-REGISTER/DBUF/BUSDIN/IR datapath
  -D-REGISTER load, ALU control (zeroes)
  -DBUF load, BUSDIN enable (UCON)

[102A/104B] - C-SCRATCHPAD
  -address modes (2-bit/4-bit), address lines
  -BUSDIN/CSP/ALU-B/D-REGISTER/DBUF/IR datapath, [1s/0s]

[105A/105E] - SR load/store
  -SR load/store/XMUX-enable
  -BUT(SR<3:0>) microbranch
  -SR/ALU-A/D-REGISTER/DBUF/IR datapath, [1s/0s]

[114A/122A4] - ALU logic functions, D[C] sources
  -ALU function/mode decode
  -ALU logic function execution
  -D[C] sources (ALUxx, CIN, save); D[C] microbranch

[130A1/13682] - ALU arithmetic functions
  -ALU arithmetic function/mode decode
  -ALU arithmetic function execution
  -ALU carry logic (in, out, lookahead)
  -D[C] sources (COUTxx, CIN)

[320A/320F] - D[C] select logic, D=ZERO logic
  -D[C] 1/8 addressing
  -BUT(D=ZERO) decode logic

[350A/352D] - A/B-SCRATCHPADS
  -addressing, lines and mode (SF, DF, RIF)
  -data patterns [1s/0s]

[361A/371B] - SR/GUARD/XMUX, RES control
  -SR shift (left, right, nop)
  -GUARD register (shift, enable/disable, test)
  -RES/SR control
  -FLTPT assemble port

[372A/372B] - CUA(PROC mux) / BUTA(SUBR-A)
  -BUTA(SUBR-A) decode/execution, RETURN register

[373A/373B] - JAMUPP and BUTA(DIAGNOSE)
  -active BUTA(DIAGNOSE) decode
  -JAMUPP clock suppress logic via external JAM

[374A1/376A] - A/B-SCRATCHPADS
  -rewrite modes test (A/B, HI/LO, etc.)
  -BYTE WRITE, DAD control
  -R-IOR-1 / FLTPT-INHIBIT addressing

[410A/410E] - BYTE / BYTE-CONSTANT / D=ZERO (loop)
  -BYTE/WORD rom decode, microbranch
  -BYTE-CONSTANT CSP addressing, DAD control
  -BUTR(D=ZERO) decode (full test)

[500C/500F] - PREFETCH / OVERLAP / SP-DEFEAT (loop)
  -PREFETCH rom decode, microbranch
  -OVERLAP rom decode
  -SP-WRITE-DEFEAT decode/control

[503A/510F] - processor UCON registers / control
  -FLAGS/EXFLAGS - read/write/microbranch
  -FPS - read/write/microbranch
  -PS - read/write/microbranch
  -MULTIPLE BUT - input/select/output
  -SERVICE/INTR decode logic, microbranch

[511A1/511B4] - MOVE FROM SAME STACK (MFSS) logic
  -decode / microbranch

[512A1/512E2] - KT SRC/DST addressing logic for ASP/BSP
  -rom decode / control

[520A/520E] - INSTR BRANCH rom
  -IR/PS inputs, microbranch output

[533A/537] - SHIFT TREE (AMUX/BMUX/CMUX/SENDMUX)
  -data path [1s/0s]
  -function decode / mux select
  -RES control / select
  -COUNTER load / read

[551A/551C] - base machine COUNTER
  -active BUTA(COUNT) decode/microbranch
  -COUNTER count execution

[610A1/610D2] - PS condition code NZVC generation
  -INSTR CLASS decode
  -BYTE/WORD CC mux select
  -CC rom addressing/data

[620A/624D] - microbreak and JAMUPP
  -MICROBREAK REGISTER load/enable/compare
  -JAMUPP via microbreak, JAM register & STATUS
  -CUA TRACKING, lock/unlock
  -JAMUPP inhibit micro-operation logic
  -JAMUPP CLEAR

[701A/701D] - BA register

-18. BIT load/read via STATUS mux
-microbranch conditions

[710A/722C] - UNIBUS function decode, error conditions
-ODD ADDR/INTERNAL ADDR/SSYN TIMEOUT errors
-18./16. bit BA modes, I/O PAGE decode, CONSOLE mode
-SERVICE/JAM register inputs (STATUS mux)
-bus function decode (DATI, DATO, etc.)

[730A/731E] - UNIBUS cycles to/from memory
-DATI(B)(P)/DATO(B) execution, side effects
-UNIBUS data lines, control lines C0, C1
-ALLOW ODD ADDR, BYTE/WORD operations
-DBUF, UNIBUS data latches load/enable
-DATI-CLKIR decode/execution
-DATIP/PROC-BBSY/BUTA(LAST) logic
-clock suppress / restart logic

[740A/740D] - UNIBUS cycle function modification
-BUTA(INSTR-1)/PREFETCH alteration of BUS CODE
-bus cycle YANK (SP DEFEAT) decode

[761A/763D] - UNIBUS interrupt (BR INTR) logic
-bus reset, microbranch on status
-line clock INTR enable, at BR6
-PS PRIORITY level/INTR PRIORITY level interaction
-SERVICE port conditions
-ALLOW BUS GRANT / VECTOR LOAD logic

8.0 ERROR HANDLING

8.1 What is an 'ERROR' ?

The concept of an 'ERROR' in DCS terms is very simple. It involves the use of the ENUA (Expected NUA), TNUA (Tracking NUA), and DCS COUNTER registers; all of which are local to the DCS module. The 11/60 processor itself has no control over the setting/clearing of 'ERROR'; in fact, it cannot directly determine whether 'ERROR' is set or clear.

The ENUA register (12 bits) is loaded from the EMIT field of the microword, under control of a DCS rom extension bit. It is setup at the beginning of a test to reflect the "EXPECTED" micro address after the test microbranch ("BUT") is executed.

The TNUA register (12 bits) is loaded continuously as the DCS microcode executes, TRACKING the progress of the microaddress field. This register contains the value of the "RECEIVED" micro address after the test microbranch is executed.

The DCS-CNTR is loaded with a value from (00)-(17) (octal), from the EMIT field of the microword, under DCS rom extension control. This register continuously counts up every microcycle. When the contents of this register is (17), the DCS hardware compares ENUA and TNUA, and does the following:

Set 'ERROR'="1" if DCS-CNTR=(17) and ENUA<>TNUA
else leave 'ERROR' unchanged from its previous value.

This is the manner by which DCS is able to set 'ERROR'. All DCS tests use this method.

Note also that the DCS hardware "locks up" the loading of the ENUA and TNUA registers after 'ERROR' is set, preserving their contents. Thus only the FIRST 'ERROR' will be recorded. There is no provision to detect subsequent errors until the previous ones are eliminated. See the DCS Maintenance Manual and Print Set for more detailed information.

8.2 FAULT DIRECTORY Format and Use

8.2.1 Basic Structure

The FAULT DIRECTORY is essentially a tabular summary of all ERROR codes the DCS is able to generate - a total of 432 entries occupying 52 pages. Each individual ERROR code entry in the FAULT DIRECTORY contains a short description of the test, and the module replacement information pertaining to that test. For ease of reference, the ERROR codes have been organized into ascending numerical order, in the range 4000(8)-6777(8).

8.2.2 Basic Use - with an example

This section describes how to use the FAULT DIRECTORY after the DCS has been run, and has indicated an error is present in the KD11-K processor.

Assume for the purpose of explanation that the DCS was started, and has returned the following values:

ERCD = 4616 (ERror CoDe)
TNUA = 7405 (Tracking NUA)

with EOP=<OFF>, and ERROR=<ON>

1. Going to the FAULT DIRECTORY, we find the entry for ERROR code 4616 to be on page 9, entry number 73.

2. Some general information about the failing test is first obtained:

   a) 'Symbolic label' - A reference to the DCS microtest which failed, in this instance TEST-115-A2.

   b) 'Line number' - A reference to the line number in the DCS microcode listing where the failing test is located (here, line number 5983).

   c) 'ENUA' - The Expected NUA of this test, in this case 7412. Note that the obtained TNUA (7405) is not the same as the test's ENUA (7412); thus the ERROR.

   d) The remainder of the line contains a short description of the function performed by this test; in this instance we note the test was diagnosing the ALU portion of the DATA-PATH module.

3. We now note that the TNUA we obtained was 7405. Scanning downward in the column of TNUA entries for this test, we find it listed as the fourth entry. More information, specific to this particular error, can now be obtained:

   a) 'Module sequence' - These 3+ columns contain (scanning left to right) the top 3+ choices of processor modules to inspect/replace, in order to locate and correct the fault(s). The module choices are listed using "slot" notation (ie, K#, where #=the slot), and a "confidence factor" to indicate the percent confidence that replacing this particular module will eliminate the fault(s). The best choice is the module called out in the first column ("#1"); then "#2" etc. Note that the percentages are rounded to the nearest 5%, and may therefore not always add up to exactly 100%.

   b) To the right of the module choices is summarized the

IC information obtained from the FAULT INSERTION effort of the DCS/KD11-K (signified by "FI"). IC information is referenced to a particular module by the notation:

K4=E23,E33-36,E89-E90,E101; K2=E12,E15,E69;

- -

- N O T E -

CALLOUT OF SPECIFIC IC'S ON A MODULE IS --NOT-- INTENDED INTENDED TO BE AN "EXHAUSTIVE-ONLY-THESE-ARE-THE-ONES" LIST. IT IS INTENDED TO PROVIDE REFERENCE TO A SPECIFIC FUNCTIONAL AREA OF A MODULE, AND GIVE REFERENCE TO THOSE IC'S WHICH CAUSED THE FAILURE DURING THE FAULT INSERTION EFFORT OF HARD STUCK-HIGH/-LOW AND ADJACENT-PIN-SHORT TYPE FAULTS. AGAIN, DO NOT ASSUME THIS LIST TO BE ALL INCLUSIVE OF THE POSSIBLE CHOICES FOR FAULTY IC'S.

- -

Another type of entry is of the format:

K404=ALU/CARRY-LOOKAHEAD;
or Kmpp=functional-description-of-logic-block

which references a particular module (#m) and page (#pp) in the KD11-K Processor Print set. This notation is used when specific fault insertion data is not available for a test.

4. In the instance when the TNUA obtained does not match any of those provided under a given test/ERROR code entry, a wild-card character ("?") has been used to allow a match with any octal digit. Thus 740? matches 7400, 7401, ..., 7407. These entries should be used for further information or when a specific TNUA is not present.

5. If there is no TNUA listed which matches the obtained TNUA, and also no wildcard entry is present; then the information about the functional nature of the test (from above), along with an intelligent interpretation of the obtained TNUA, will be required. The following table lists some TNUA's that might be obtained in such a case:

(see table on following page)

TNUA	Cause
4000	DCS forced to its starting address
4777\ 4756 > 4747/	an unexpected JAMUPP condition occurred
7361	in UNIBUS function tests, a JAMUPP did not occur when expected
7400-7777	the "standard" BUT() target area for DCS micro-tests

8.3 'SCOPE Loop' Facility

8.3.1 General Information

The 'SCOPE loop' implementation provided by DCS is almost identical to that provided in the standard MAINDEC macro diagnostic program. What the 'SCOPE loop' does is to repeatedly execute the same sequence of diagnostic test code; this allows the technician to 'scope' appropriate logic signals in an effort to zero-in on the fault.

The DCS 'SCOPE loop' occurs ONLY and ALWAYS when 'ERROR' is set. There are no user options to change the size or range of the loop - all these parameters have been fixed in microcode and hardware. The loops have been setup to be as tight, and as useful, as was possible. Most are in the range of 10-30 microwords, although some (three, in particular) are larger.

8.3.2 Implementation and Use

A DCS extension rom control bit is used to enable the 'SCOPE loop' check at selected points in DCS code execution. These points are recognized by the following:

```
SCOPE123:
     <possible some other functions>
     NEXT,   BUTD[SCOPE],   !NO ERROR:  "TEST124" [+1. WORDS]
             J/TEST124      !   ERROR:  "LOOP123" [-5. WORDS]
```

The two comments "ERROR/NO-ERROR" tell the user where the DCS code will branch, depending upon the current state of 'ERROR'. Usually, the 'NO-ERROR' condition falls thru to the next word (eg, +1. words). For the 'ERROR' case, the loop is ALWAYS backwards (ie, up the page, toward the point where the error was detected). The "-number" notation gives a relative count of the number (approximately) of micro words backwards in the jump.

This facility can be used in two modes - dynamic and static. Either mode must be entered via the use of the DCS 'RUN/STOP' switch set to the 'RUN' position, as this then enables the DCS code to execute continuously. The results are generally undefined if the switch is set to 'STOP', and the "DIAG" button was used to enter the loop.

Dynamic mode requires the use of an oscilloscope, logic analyzer, etc., and the determination of an appropriate logic signal on which to sync. The DCS microcode then automatically remains in this tight loop to allow observation of the suspected faulty signals, at processor cycle speed.

Static mode is entered in the same manner as dynamic; but afterwards the "SINGLE-MICROSTEP/MAINTENANCE-CLOCK" feature of the 11/60 processor (on K6 TIMING module, the two switches - see prints) is enabled. This allows the processor to be single micro - stepped, under user control. The additional debug features of the DCS can now be employed: the BUSDIN/DOUT display LEDs (16), and the (2) "free" LEDs. See the DCS Maintenance Manual for further details. Also available are the NUA (Next-U-Address) LEDs on the 11/60 processor "UWORD" module (K2). Note that these 'point' at the NEXT microword to be executed, not the current.

9.0 REVISION HISTORY

9.1 Revision Number

After a successful 'END-OF-PASS' indication, console internal exam functions can be used to obtain the 'DCS Microcode Revision Number', stored in the macro machine general register R5. BIT<15> of this number will also be set, indicating successful 'END-OF-PASS' was reached. The initial version of the microcode will display:

(100101)

with subsequent versions to be:

(100102)
(100103) etc

If, however, an 'ERROR' is obtained, one might still be able to obtain the DCS microcode revision number. In this instance BIT<15> will/should be clear, and the lower bits the revision code:

(000101)
(000102) etc

However, this number must be taken with caution, as the error may or may not have influenced the storing of the revision number in the register.

9.2 Revisions To DCS Code

Note that ALL revisions to the DCS microcode / FAULT DIRECTORY are to be documented in this section, with the following information supplied:

a) A short description of the problem(s) found, and how they were corrected.

b) Updated MAINDEC (MD) and DCS (uCODE) revision information.

c) Date of fix, and person responsible for fix.

d) The test/ERROR codes affected by the changes.

Note that the changes MUST also be incorporated into the DCS microcode listing, and/or the FAULT DIRECTORY listing at the appropriate points. Actual microcode changes will be entered as ECO's to individual ROM patterns on the DCS module (M7871). Contact PDP-11/60 Support Engineering for the procedure.

REVISION MD/uCODE	Date	Who	Explanation
A/101	18-Jan-77	DNN	Initial Release
B/101	22-Jun-77	DNN	No microcode changes; documentation added/updated.

10.0 DCS VERIFICATION / SELF-TEST

'VERIFY MODE' is a self-check mode designed to verify the operation of the DCS module and its associated error detection/indication support logic.

10.1 Requirements

This mode of operation requires that a known good PDP-11/60 system (as described in Section 2) be used to test/verify a DCS module, so that errors detected by the DCS are due to the DCS module under test, and not due to the other system components. The set of PDP-11/60 processor macro diagnostics, or a known good DCS module, can be used to perform such a verification of the host system.

10.2 Verification Method

The method (or algorithm) used to perform the DCS self-verification is as follows:

Hardware on the DCS module is conditioned to execute a single pass thru the DCS microcode, via setting the DCS 'NORMAL/VERIFY' switch to the 'VERIFY' position. This also alters the 12 bit hardware counter on the DCS module from a 'Pass Counter' to the 'Verify Counter'.

At the start of a 'Verify Pass', this counter is preset to a specific value; predetermined so that when 'END-OF-PASS' is signaled by the DCS microcode, this counter will have a value of octal (7777), or be at the point of overflow (carry out) enabled.

As the DCS executes in 'VERIFY MODE', this counter is incremented whenever:

1. A microword is executed from page 7, or
2. A microword is executed with the 'VERIFY' bit (a page 4-6 only DCS ROM extension bit) asserted. These 'VERIFY' bits have been scattered, more or less at random, throughout the DCS microcode. Thus this counter will be incremented at random intervals during a 'Verify Pass'.

The DCS code executes approximately 350,000 microwords per pass; thus the counter will overflow between 2-85 times (depending upon the number of 'VERIFY' bits and page 7 references encountered) before the 'END-OF-PASS' / 'Verify Counter' overflow match. Physically, the verify count is retained modulo 4096 (12 bits), with only the low order bits of the count used in the comparison.

A verification will be considered successful only if a verify counter overflow point exactly matches the microword which signals 'END-OF-PASS' (done only once) in the DCS microcode.

10.3 Procedure And Indications

10.3.1 Procedure

To run the DCS in verify mode, the following procedure is followed:

1. Install the DCS in the PDP-11/60 as detailed in Section 3
2. Set the DCS switches:

   'RUN/STOP' = 'STOP' and
   'NORMAL/VERIFY' = 'VERIFY'

3. Now set:
   'RUN/STOP' = 'RUN'
4. The DCS now executes a single 'Verify Pass'
5. At the end of the 'Verify Pass' the DCS enters a microcode loop, in which:
   - An error is forced with specific 'ENUA', 'TNUA', and 'ERROR code' values
   - 'END-OF-PASS' is repeatedly signaled
   - A 'Scope Loop' branch is executed

   See the DCS microcode listing, under 'Verify Mode Code' for the exact sequence of operations.
6. At this time examine the DCS module LEDs for comparison with their expected contents, as noted below.
7. To return control to the PDP-11/60 after a 'Verify Pass', position:

   'RUN/STOP' = 'STOP' and
   'NORMAL/VERIFY' = 'NORMAL'

   And then generate a "CONSOLE INIT" ("START/HALT") on the operator's console

10.3.2 Indicators

Only the status described below is acceptable to signal a successful DCS verification. Assuming a known good PDP-11/60 system, any deviation from the description (below) should be considered an indication of a fault in the DCS module under

test.

After a 'Verify Pass', indications on the DCS module will be:

'TNUA' = (7522)
'ERROR' = (4255)
(Note the alternating ON/OFF pattern)

'ENUA' = (7523) was loaded to force
an 'ERROR' indication

'EOP' LED - ON, Approx. 1/2 brilliance
'ERROR' LED - ON, continuously

This will be the only instance when both
the 'EOP' and 'ERROR' LEDs should be on
simultaneously.

Indications on the PDP-11/60 console should be:

"RUN" LED - OFF continously
"PROC" LED - OFF continously
"USER" LED - OFF continously
"CONSOLE" LED - OFF/ dimly lit
"BATTERY" LED - <indeterminate>

Octal display = (212121), with the
decimal points either on or off.

11.0 MISCELLANEOUS

11.1 ACT/APT/XXDP

The DCS module is not directly supported by ACT/APT/XXDP software at this time.

11.2 Macro Instruction Interface

11.2.1 DCS Presence

Presence of a DCS module in slot 1 is indicated by a bit in the "WHAMI" register:

NOTE

See PDP-11/60 documentation for a full description of the "MED" instruction.

```
MED     ,022            ;READ WHAMI -> R0
BIT     #BIT08,R0       ;BIT<08>=1, DCS PRESENT
                        ;BIT<08>=0, NO DCS IN SLOT-1
```

11.2.2 DCS Register Access

Access to several of the internal registers and status bits is also possible via the "MED" instruction:

```
MED     ,152            ;READ DCS 'TNUA'
```

After execution, R0's contents is as follows:

```
0000←#TNUA<11:00>
```

Similarly:

```
MED     ,153            ;READ DCS 'EOP/ERROR'
```

and R0's contents:

```
ERROR#01#EOP#ERRCOD<11:00>
```

BIT<15> = ERROR(1)H
BIT<14:13> = "01", code for DCS module
BIT<12> = EOP(1)H

11.2.3 Macro Instruction Startup Of DCS

The DCS may also be started via a "MED" instruction. Note, however, that this is a one-way tranfer of control; there is

no means to re-enter an executing macroinstruction program without operator intervention at the operator's console.

This method simulates the operator depression of the "CNTRL/DIAG" keys via loading the KD11-K microaddress pointer (NUA) with the starting address of the "DIAGNOSE" key service routine.

```
        MOV     #011410,R0      ;(1141) = "DIAGNOSE"
        MED     ,347            ;WRITE NUA
        ;NEVER COME BACK TO HERE
        ;DCS ALWAYS EXITS TO "CONSOLE" MODE
```

MAINDEC-11-DQKUB-BO PDP-11/60 [KD11-K] DCS FAULT DIRECTORY

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
1)	4000	TEST001	2633	6252	NUA SEQUENCING, PAGE (4) -> (2) [2==6], UBF=(34)				
					4000	K3/99	../..	../..	FI; K3=E6,E15
					4203	K2/99	../..	../..	FI; K2=E41,E47
					4252	K2/90	K3/5	K4/5	FI; K2=E13-E14,E34-E35,E40-E41,E46-E47,E58-E59,E62, E64-E65,E67-E68,E72-E74,E78-E80,E91; K3=E34, E111; K4=E3
					4253	K2/99	../..	../..	FI; K2=E14
					4256	K2/99	../..	../..	FI; K2=E34,E46,E59,E68,E74,E80
					4257	K2/99	../..	../..	FI; K2=E40,E65
					4747	K2/75	K3/25	../..	FI; K2=E2,E29,E52-E53,E79; K3=E6,E26
					4756	K2/99	../..	../..	FI; K2=E70
					4757	K3/99	../..	../..	FI; K3=E4,E7
					4776	K2/99	../..	../..	FI; K2=E60
					4777	K2/75	K3/10	K6/5	K4/5 K7/5 FI; K2=E1-E7,E10-E18,E21-E25,E27-E39, E41-E54,E57-E59,E61-E81,E84,E90,E93-E96,E100, E104; K3=E1-E20,E22,E24-E26,E32,E39,E41,E48, E101; K6=E40,E43,E60-E61,E66,E78-E81,E83,E92; K4=E18,E26,E29-E30,E38,E71,E87; K7=E36,E52,E74
					5130	K2/99	../..	../..	FI; K2=E94
					5247	K2/99	../..	../..	FI; K2=E47
					5276	K2/99	../..	../..	FI; K2=E6,E33,E60
					6000	K2/99	../..	../..	FI; K2=E7-E8,E19,E40
					6052	K2/55	K3/45	../..	FI; K2=E1,E7,E117; K3=E58,E91
					6201	K2/99	../..	../..	FI; K2=E70-E71
					6212	K3/55	K2/45	../..	FI; K3=E58,E91; K2=E2,E7
					6231	K2/99	../..	../..	FI; K2=E62
					6235	K2/99	../..	../..	FI; K2=E62
					6242	K3/55	K2/45	../..	FI; K3=E21,E81; K2=E2,E8
					6250	K3/55	K2/45	../..	FI; K3=E21,E81; K2=E2,E8
					6253	K2/55	K3/45	../..	FI; K2=E2,E60,E66,E69,E75,E81; K3=E21,E23,E44,E68
					6256	K2/55	K3/45	../..	FI; K2=E2,E8-E9,E21,E27,E60,E66,E69,E75,E81; K3=E21-E22,E37-E39,E54,E56,E74-E75
					6257	K3/80	K2/20	../..	FI; K3=E37-E38,E74; K2=E8
					6272	K2/95	K3/5	../..	FI; K2=E2-E3,E6-E7,E12,E15,E18,E24,E30,E36; K3=E52
					6277	K2/99	../..	../..	FI; K2=E2,E13
					6352	K2/80	K3/20	../..	FI; K2=E1,E3,E6-E7,E12,E15,E18,E24,E30,E36; K3=E51, E58,E70
					6372	K2/99	../..	../..	FI; K2=E7
					6652	K2/80	K3/20	../..	FI; K2=E1,E19,E42,E59,E65,E68,E74,E80; K3=E23,E63
					7077	K2/99	../..	../..	FI; K2=E117
					7231	K2/99	../..	../..	FI; K2=E14
					7252	K2/99	../..	../..	FI; K2=E35,E47,E58
					7752	K2/99	../..	../..	FI; K2=E48
					7777	K2/99	../..	../..	FI; K2=E48

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
2)	4255	VFY003	18313	7523	THIS ERROR-CODE EXPECTED IN DCS "VERIFY MODE"				
					7522	../..	../..	../..	THIS TNUA EXPECTED IN DCS "VERIFY MODE"
					7522	K6/50	K7/40	K3/5	K2/5 K4/5 FI; K6=E3-E5,E12,E14,E22,E26,E31-E32, E34,E37-E40,E42-E43,E46,E54,E56,E61-E62,E64,E69, E71-E72,E76,E78-E81,E86-E88,E90,E94-E96,E98-E102, E104-E105,E108; K7=E2,E4,E8,E12,E14-E15,E18-E23, E25-E27,E34-E35,E37-E40,E43,E45-E47,E49,E52,E54, E59,E62-E63,E66,E68,E70-E71,E87,E95,E97-E98; K3=E2,E6-E8,E10,E12,E15,E21-E26,E34,E52,E54,E64; K2=E2-E3,E6-E9,E21,E36,E50,E60,E66,E75,E81; K4=E8,E16
					????	K1/99	../..	../..	DCS VERIFY MODE, BAD TNUA LATCHED
3)	4377	TEST007	2749	7303	NUA SEQUENCING, PAGE (4) -> (3) [3==7], UBF=(35)				
					7301	K2/99	../..	../..	FI; K2=E61
					7303	K2/65	K4/35	K3/5	K6/5 FI; K2=E4,E10,E16,E22,E25-E26,E28,E31,E37, E43,E49,E52,E70-E71,E76-E77,E97; K4=E1,E12-E15, E29,E38,E70; K3=E33; K6=E34
					7307	K2/60	K3/40	../..	FI; K2=E9,E21,E27; K3=E21-E22
					7343	K2/99	../..	../..	FI; K2=E7
					7376	K3/99	../..	../..	FI; K3=E34
					7777	K2/99	../..	../..	FI; K2=E23,E29
4)	4450	TEST730C1	17211	7402	BUTA(LAST) CLEARS PROC BBSY (DATIP); EMIT=(052525) ON BUSDIN				
					7400	K5/99	../..	../..	FI; K5=E94
					7401	K6/50	K7/35	K5/15	FI; K6=E4,E61,E70,E79,E103; K7=E31,E39,E46,E49; K5=E95,E97,E105
5)	4451	TEST740D	17653	7402	INSTR1*-OVERLAP, BUS CYCLE YANKED				
					4747	K5/65	K6/35	../..	FI; K5=E95; K6=E40
					7401	K6/99	../..	../..	FI; K6=E43
6)	4452	TEST740C	17619	7402	-INSTR1*PREFETCH, BC<0>=BC<0>				
					4747	K2/99	../..	../..	FI; K2=E41
					7401	K2/99	../..	../..	FI; K2=E105
7)	4453	TEST740B	17591	7402	INSTR1*PREFETCH, BC<0>="0"				
					7401	K2/65	K3/35	../..	FI; K2=E82,E105; K3=E46
8)	4454	TEST731E	17467	7432	BUS DATI-CLKIR, BA=(000000); IR=(000125) E88/(432) LOADED				
					4747	K3/99	../..	../..	FI; K3=E1
					7402	K6/99	../..	../..	FI; K6=E5
					7407	K6/99	../..	../..	FI; K6=E4,E108
					7412	K6/85	K3/15	../..	FI; K6=E3,E5; K3=E45

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
9)	4455	TEST731D	17428	7402	BUS DATI-CLKIR, BA=(000000); SERVICE=(000340)				
					4747	K5/99	../..	../..	FI; K5=E39
					7400	K6/99	../..	../..	FI; K6=E108
10)	4456	TEST731C	17401	7432	BUS DATI, BA=(000000); MEM(000000)=(000125) VIA DATO/DATOB/DATI				
					7400	K6/99	../..	../..	FI; K6=E93
					7402	K6/99	../..	../..	FI; K6=E36,E43,E85,E90,E93
					7405	K4/99	../..	../..	FI; K4=E28
					7420	K5/99	../..	../..	FI; K5=E94,E105
					7434	K6/85	K7/15	../..	FI; K6=E11,E55,E71; K7=E49
11)	4457	TEST731B	17363	7412	IR=(125200) E78/(412); NO BUS FUNCTIONS CLOCK-IR EXCEPT DATI-CLKIR				
					7400	K2/65	K3/35	../..	FI; K2=E34,E84; K3=E48
12)	4460	TEST730C	17188	7402	DATIP HOLDING BUS (PROC BBSY); DU=(125252) ON BUSDIN				
					7401	K6/65	K7/35	../..	FI; K6=E70,E79,E103; K7=E17,E62
13)	4461	TEST730D	17233	7402	BUS DATO, BA=(000000), DATIB*BYTE*ODD, BA=(000001); SERVICE=(000340)				
					4747	K6/50	K2/50	../..	FI; K6=E47; K2=E105
					7400	K6/90	K7/15	../..	FI; K6=E38-E39,E54; K7=E49
					7401	K6/99	../..	../..	FI; K6=E38
14)	4462	TEST730E	17286	7402	BUS DATO, BA=(000000), DATIB*BYTE*ODD, BA=(000001); DU=BUSDIN=(052525)				
					7400	K6/90	K5/10	K4/5	FI; K6=E5,E46,E66-E67,E72,E74-E75,E80,E83-E84,E86, E88,E90,E92-E93,E108; K5=E53,E63,E99-E101,E109, E112-E113,E115,E122; K4=E28
					7403	K6/99	../..	../..	FI; K6=E92-E93
15)	4464	TEST722B	17004	7402	INVALIDATE, ODD ADDR JAM; JAM=(101004)				
					????	K6/99	../..	../..	K605=UNIBUS-FUNCTION-DECODE
16)	4465	TEST722C	17029	7402	INVALIDATE, 16. BIT PBA, -I/O PAGE(6); SERVICE=(002340)				
					7400	K6/99	../..	../..	FI; K6=E59
					????	K6/99	../..	../..	K605=UNIBUS-FUNCTION-DECODE
17)	4466	TEST730B	17149	7402	BUS DATIP, BA=(000001); DU=(125252) AFTER ON BUSDIN				
					4747	K7/65	K6/35	../..	FI; K7=E16,E25,E32; K6=E55,E76,E88
					7400	K6/95	K5/5	../..	FI; K6=E66-E67,E74-E75,E83-E84,E92-E93; K5=E53,E63, E66
					7401	K6/65	K7/35	../..	FI; K6=E11,E19,E47,E55,E63,E66-E67,E69,E71,E74-E76, E79,E83-E84,E92-E93,E98-E99,E101,E103,E105; K7=E10,E17,E21,E32-E33,E49,E101
					7403	K6/99	../..	../..	FI; K6=E92-E93

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
18)	4471	TEST730A	17084	7402	BUS DATO, BA=(000000), D=(125252); CHECK DBUF=0 AFTER				
					4747	K6/65	K7/25	K5/10	FI; K6=E2-E3,E19-E20,E26,E40,E76,E85,E87-E88, E96-E98; K7=E2,E10,E32-E33,E36,E57-E58,E60; K5=E35,E42-E43,E62
					7400	K5/99	../..	../..	FI; K5=E90,E107-E108,E114,E120-E121
					7401	K6/65	K7/20	K4/10 K3/5	FI; K6=E11,E56,E64,E69,E72,E85,E101,E103; K7=E10,E33; K4=E28,E55; K3=E42
					7403	K6/50	K5/25	K2/25	FI; K6=E101; K5=E91; K2=E100
19)	4472	TEST1328Z	7572	7417	BUTR(X#D[C]#XX), D[C]=COUT15="1"; A(0)+B(1)+CI(1)=D(0)+CO(1)				
					7413	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
20)	4473	TEST1368Z	8010	7402	(122645)+(132264)+(0)=(170360); CHECK COUT15=(0)				
					7403	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
21)	4474	TEST006	2730	4377	NUA SEQUENCING, NO 'BUT'				
					4777	K2/99	../..	../..	FI; K2=E17,E63
22)	4475	TEST1368I	7983	7434	(122645)+(132264)+(0)=(170360); CARRY LOOKAHEAD LOGIC				
					7400	K4/99	../..	../..	FI; K4=E47
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
23)	4476	TEST136A2	7961	7403	(055132)+(132264)+(1)=(007417); CHECK COUT15=(1)				
					7266	K2/80	K3/20	../..	FI; K2=E8-E9,E21,E27; K3=E21
					7402	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
24)	4477	TEST135B2	7904	7413	(055132)+(113226)+(0)=(170360); CHECK COUT15=(0)				
					7417	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
25)	4500	TEST133A2	7630	7403	(103607)+(103607)+(1)=(007417); CHECK COUT15=(1)				
					7402	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
26)	4501	TEST133B1	7652	7434	(074170)+(074170)+(0)=(170360); CARRY LOOKAHEAD LOGIC				
					7402	K4/50	K2/50	../..	FI; K4=E49; K2=E102
					7420	K4/99	../..	../..	FI; K4=E49
					7421	K3/99	../..	../..	FI; K3=E71
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
27)	4502	TEST133B2	7679	7402	(074170)+(074170)+(0)=(170360); CHECK COUT15=(0)				
					7403	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
28)	4503	TEST134A2	7742	7403	(045513)+(141703)+(1)=(007417); CHECK COUT15=(1)				
					7402	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
29)	4504	TEST134B1	7764	7434	(132264)+(036074)+(0)=(170360); CARRY LOOKAHEAD LOGIC				
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
30)	4505	TEST134B2	7791	7401	(132264)+(036074)+(0)=(170360); CHECK COUT15=(0)				
					7403	K5/99	../..	../..	FI; K5=E95
					740?	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
31)	4506	TEST135A2	7855	7417	(122645)+(064551)+(1)=(007417); CHECK COUT15=(1)				
					7413	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
32)	4507	TEST135B1	7877	7434	(055132)+(113226)+(0)=(170360); CARRY LOOKAHEAD LOGIC				
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
33)	4511	TEST134A1	7705	7434	(045513)+(141703)+(1)=(007417); CARRY LOOKAHEAD LOGIC				
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
34)	4513	TEST135A1	7818	7434	(122645)+(064551)+(1)=(007417); CARRY LOOKAHEAD LOGIC				
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
35)	4515	TEST136A1	7931	7434	(055132)+(132264)+(1)=(007417); CARRY LOOKAHEAD LOGIC				
					7421	K4/75	K3/25	../..	FI; K4=E64; K3=E74
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
36)	4516	TEST132A2	7527	7403	BUTR(D[C]$BA00), D[C]=COUT15="1"; A(1)+B(0)+CI(1)=D(0)+CO(1)				
					7402	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
37)	4517	TEST132B1	7547	7434	ALU=DIVIDE=A-MINUS-B; A(052525), B(052525), D(000000), D[C]="1"				
					7400	K3/80	K4/20	../..	FI; K3=E41,E53,E61; K4=E16
					7402	K3/99	../..	../..	FI; K3=E51
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
38)	4521	TEST132A1	7502	7434	ALU=A-MINUS-B; A(125252), B(125252), D(000000)				
					7400	K4/70	K3/30	../..	FI; K4=E49; K3=E42,E92
					7402	K4/55	K3/45	../..	FI; K4=E6,E11,E17,E26,E96; K3=E41,E82
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
39)	4523	TEST133A1	7600	7434	(103607)+(103607)+(1)=(007417); CARRY LOOKAHEAD LOGIC				
					7400	K4/75	K3/25	../..	FI; K4=E8,E49,E71; K3=E53
					7402	K3/99	../..	../..	FI; K3=E43,E84
					7420	K4/99	../..	../..	FI; K4=E49,E88
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
40)	4530	TEST130B1	7334	7434	ALU=A-PLUS-B-PLUS-1; A(125252), B(125252), D(052525)				
					7400	K4/70	K3/15	K2/15	FI; K4=E49,E101-E102,E110; K3=E53; K2=E50
		[Continued]			7402	K4/80	K3/20	../..	FI; K4=E49,E98,E101; K3=E41

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
	4530	TEST130B1	[Continued]						ALU=A-PLUS-B-PLUS-1; A(125252), B(125252), D(052525)
					7406	K4/99	../..	../..	FI; K4=E110
					7420	K4/99	../..	../..	FI; K4=E49,E102,E112
					7421	K4/99	../..	../..	FI; K4=E71
					7436	K4/99	../..	../..	FI; K4=E112
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
41)	4532	TEST1308Z	7365	7403					BUTR(COUNT#D[C]), D[C]=COUT15="1"; A(1)+B(1)+CI(0)=D(0)+CO(1)
					7402	K2/50	K3/30	K4/25	FI; K2=E35,E41,E61,E77,E85; K3=E4,E6-E7,E11,E15, E43; K4=E63-E64
42)	4537	TEST320D	8197	7403					BUTR(COUT07#DOUT07#XX), TARGET="01*"
					7401	K3/85	K4/15	../..	FI; K3=E53,E55-E56,E95; K4=E10
					7407	K3/99	../..	../..	FI; K3=E74
43)	4541	TEST131A1	7392	7434					ALU=A-PLUS-B-PLUS-PS[C]; A(125252), B(052525), D(177777), PS[C]=(0)
					7400	K3/75	K4/25	../..	FI; K3=E35,E41,E46,E71,E84; K4=E49
					7402	K3/99	../..	../..	FI; K3=E82
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
44)	4543	TEST320A	8098	7403					D[C] ADDR SELECT, CODE="010"=ALU00="1" ONLY ONE SET
					7402	K4/99	../..	../..	K404=D[C]-SELECT-LOGIC
45)	4544	TEST131A2	7423	7401					BUTR(D[C]#BA00), D[C]=COUT15="0"; A(1)+B(0)+CI(0)=D(1)+CO(0)
					7403	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
46)	4546	TEST131B1	7443	7434					ALU=DIVIDE=A-PLUS-B; A(052525), B(125252), D(177777), D[C]="0"
					7400	K3/99	../..	../..	FI; K3=E82
					7402	K3/99	../..	../..	FI; K3=E61,E84
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
47)	4550	TEST130A2	7314	7402					BUTR(COUNT#D[C]), D[C]=COUT15="0"; A(0)+B(0)+CI(1)=D(1)+CO(0)
					7403	K4/99	../..	../..	FI; K4=E63-E64
48)	4552	TEST320B	8138	7400					BUT(D<14:00>=0#D15), D=(000001), TARGET="00"
					7402	K2/99	../..	../..	FI; K2=E40,E88,E94,E99,E112
49)	4553	TEST762A1	17899	NONE					DL11-W ENABLED FOR BR6 INTR; DID NOT RESPOND W/ BG-SERVICE-L WITHIN 22. MS.
					4553	K7/85	K6/10	K5/5 K3/5	FI; K7=E3,E5-E6,E11,E13,E16-E17,E19-E20, E25-E26,E28,E35-E36,E39,E76,E80; K6=E25,E34,E62; K5=E1; K3=E74
50)	4554	TEST320E	8217	7403					D[C] ADDR SELECT, CODE="101"=COUT07="1" ONLY ONE SET
					7401	K4/99	../..	../..	FI; K4=E63
51)	4556	TEST320F	8256	7405					BUTR(COUT07#DOUT07#XX), TARGET="10*"
					7407	K3/99	../..	../..	FI; K3=E56,E95

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
52)	4562	TEST320C	8157	7413	BUTR(X#D[C]#XX), D[C]=COUT07="0", COUT15="1"				
					7417	K4/99	../..	../..	FI; K4=E63-E64
53)	4566	TEST551C	14539	NONE	B.M. DATAPATH COUNTER, BUTA(COUNT-IS-377#D[C]), COUNT FROM (000):(377)				
					4531	K3/99	../..	../..	FI; K3=E56
					????	K2/80	K4/20	../..	K207=ACTIVE-BUT; K409=CNTR
54)	4570	TEST122A2	7172	7403	BUTR(COUNT#D[C]), D[C]=CINMUX="1", ALU=A-IOR-B				
					7402	K3/99	../..	../..	FI; K3=E43,E61,E71
55)	4571	TEST721A	16840	4777	DATOB*-BYTE, ODD ADDR JAM, BA=(120001)				
					7341	K6/99	../..	../..	K605=UNIBUS-FUNCTION-DECODE
56)	4572	TEST537A	14413	7402	SHIFTER, 'SENDMUX' CMUX<00> OUTPUT ON CMUX/LEFT-1				
					7400	K4/90	K5/5	K3/5	FI; K4=E77-E78,E80; K5=E97; K3=E61
57)	4573	TEST721B	16894	7402	DATOB*-BYTE, ODD ADDR JAM; JAM=(101004)				
					740?	K7/99	../..	../..	K705=JAM-FLAGS,K708=STATUS-MUX
58)	4575	TEST551A	14469	NONE	B.M. DATAPATH COUNTER, BUTA(SR1-0#COUNT-IS-377), COUNT FROM (000):(377)				
					4531	K3/75	K4/25	../..	FI; K3=E36,E54; K4=E91
					4547	K3/90	K4/10	../..	FI; K3=E36,E54,E56,E64; K4=E91
					4555	K4/90	K2/10	../..	FI; K4=E20,E84,E87,E90-E91; K2=E55
					????	K2/80	K4/20	../..	K207=ACTIVE-BUT; K409=CNTR
59)	4576	TEST551B	14498	7400	B.M. DATAPATH COUNTER, BUTA(COUNT-IS-377), COUNT FROM (000):(377)				
					7401	K3/99	../..	../..	FI; K3=E64
					7402	K3/99	../..	../..	FI; K3=E44
					????	K2/80	K4/20	../..	K207=ACTIVE-BUT; K409=CNTR
60)	4577	TEST721C	16918	7402	DATOB*-BYTE, 16. BIT PBA, -I/O PAGE(5); SERVICE=(002340)				
					7400	K6/99	../..	../..	FI; K6=E59
61)	4601	TEST115A1	5939	7412	ALU=NOT-A; A(052525), B(177777), D(125252), BITS<15:12>=(12)				
					7400	K4/85	K7/10	K2/5	FI; K4=E1,E4-E5,E7,E15-E16,E22,E24,E34,E40-E42, E98; K7=E41,E70; K2=E70
					7402	K4/99	../..	../..	FI; K4=E33-E34
					7403	K4/75	K2/25	../..	FI; K4=E26; K2=E39
					7405	K4/55	K3/45	../..	FI; K4=E14,E21,E23; K3=E43,E52-E53,E84
					7407	K4/99	../..	../..	FI; K4=E4
					7410	K4/99	../..	../..	FI; K4=E34
					7413	K4/99	../..	../..	FI; K4=E26,E34,E62
					7416	K4/99	../..	../..	FI; K4=E17,E34,E54
					7417	K4/99	../..	../..	FI; K4=E1,E6,E8,E10,E14-E18,E20-E21,E23-E24, E26-E27,E29,E37,E44,E46

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
62)	4602	TEST115B4	6044	7402	BUTR(COUNT#D[C]), D[C]=PS[C]="0"				
					7403	K4/50	K3/45	K2/10	FI; K4=E2-E3,E56,E63; K3=E36,E57,E63; K2=E70
63)	4603	TEST114A2	5906	7402	BUTR(COUNT#D[C]), D[C]=CINMUX=PS[C]="0", ALU=ZERO				
					7403	K4/50	K3/50	../..	FI; K4=E56,E63,E72,E78; K3=E22,E41,E54,E71-E73
					7406	K3/99	../..	../..	FI; K3=E74
64)	4604	TEST115A4	5967	7403	BUTR(COUNT#D[C]), D[C]=CINMUX="1", ALU=NOT-A				
					7402	K4/55	K3/45	../..	FI; K4=E2-E3,E56,E63,E71-E72,E78,E86; K3=E41,E43, E46,E54,E61-E62,E71,E75
65)	4605	TEST121C2	7009	7412	ALU=A-XOR-B; A(000000), B(125252), D(125252), BITS<11:06>=(52)				
					7434	K7/99	../..	../..	FI; K7=E20
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
66)	4606	TEST116B	6326	7434	ALU=ZERO; A(125252), B(052525), D(000000)				
					7402	K3/99	../..	../..	FI; K3=E102
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
67)	4607	TEST114A	5874	7434	ALU=ZERO; A(177777), B(177777), D(000000)				
					7400	K3/99	../..	../..	FI; K3=E43,E82
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
68)	4611	TEST115C1	6104	7412	ALU=NOT-A; A(052525), B(000000), D(125252), BITS<15:12>=(12)				
					7400	K3/99	../..	../..	FI; K3=E51,E82
					7405	K4/99	../..	../..	FI; K4=E6,E17,E23,E31-E34,E40-E43
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
69)	4612	TEST115B3	6077	7432	ALU=NOT-A; A(125252), B(177777), D(052525), BITS<05:00>=(25)				
					7420	K4/90	K5/10	../..	FI; K4=E28,E37,E40-E41; K5=E66
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
70)	4613	TEST115B2	6060	7405	ALU=NOT-A; A(5:5252), B(177777), D(052525), BITS<11:06>=(25)				
					7400	K4/90	K2/10	../..	FI; K4=E37,E41-E42,E89,E108; K2=E26
					7402	K4/99	../..	../..	FI; K4=E98
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
71)	4614	TEST115B1	6021	7405	ALU=NOT-A; A(125252), B(177777), D(052525), BITS<15:12>=(05)				
					7400	K4/99	../..	../..	FI; K4=E16
					7401	K4/99	../..	../..	FI; K4=E34
					7404	K4/99	../..	../..	FI; K4=E34
					7407	K4/99	../..	../..	FI; K4=E34
					7412	K4/99	../..	../..	FI; K4=E14,E23
					7415	K4/99	../..	../..	FI; K4=E34
					7417	K4/90	K6/10	../..	FI; K4=E4,E12-E13,E21-E24; K6=E34

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
72)	4615	TEST115A3	6000	7425					ALU=NOT-A; A(052525), B(177777), D(125252), BITS<05:00>=(52)
					7420	K4/90	K5/10	../..	FI; K4=E31,E37,E40-E41,E44,E61,E75-E76; K5=E63,E66
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
73)	4616	TEST115A2	5983	7412					ALU=NOT-A; A(052525), B(177777), D(125252), BITS<11:06>=(52)
					7400	K4/80	K2/15	K3/5	FI; K4=E5-E7,E11,E17-E18,E20,E24,E26,E28,E32, E41-E43,E60,E66-E68,E88-E89,E108; K2=E32-E33, E38-E39,E44-E45,E50-E51,E53-E54; K3=E27,E41,E82
					7402	K3/99	../..	../..	FI; K3=E53,E61
					7403	K5/99	../..	../..	FI; K5=E53
					7405	K4/90	K3/15	../..	FI; K4=E10,E22,E24,E98; K3=E84
					7434	K4/50	K2/50	../..	FI; K4=E71; K2=E117
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
74)	4617	TEST115C2	6126	7412					ALU=NOT-A; A(052525), B(000000), D(125252), BITS<11:06>=(52)
					7400	K4/99	../..	../..	FI; K4=E41-E42
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
75)	4620	TEST116A3	6271	7412					ALU=NOT-A-AND-B; A(000000), B(125252), D(125252), BITS<11:06>=(52)
					7400	K4/99	../..	../..	FI; K4=E41-E42,E89
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
76)	4621	TEST116A2	6257	7403					BUTR(COUNT#D[C]), D[C]=ALU15="1", D=(125252)
					7402	K4/99	../..	../..	FI; K4=E2-E3,E56,E63-E64
77)	4623	TEST116A1	6235	7412					ALU=NOT-A-AND-B; A(000000), B(125252), D(125252), BITS<15:12>=(12)
					7400	K4/99	../..	../..	FI; K4=E15,E24,E31-E34,E40-E43
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
78)	4624	TEST115D3	6203	7432					ALU=NOT-A; A(125252), B(000000), D(052525), BITS<05:00>=(25)
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
79)	4625	TEST115D2	6186	7405					ALU=NOT-A; A(125252), B(000000), D(052525), BITS<11:06>=(25)
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
80)	4626	TEST115D1	6164	7405					ALU=NOT-A; A(125252), B(000000), D(052525), BITS<15:12>=(05)
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
81)	4627	TEST115C3	6143	7425					ALU=NOT-A; A(052525), B(000000), D(125252), BITS<05:00>=(52)
					7420	K4/50	K3/50	../..	FI; K4=E40; K3=E11
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
82)	4630	TEST116C5	6429	7401					BUTR(D[C]#BA00), D[C]=D[C]="0"
					7403	K4/99	../..	../..	FI; K4=E63-E64,E78

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
83)	4631	TEST116C4	6413	7432					ALU=NOT-A-AND-B; A(000000), B(052525), D(052525), BITS<05:00>=(25)
					4631	K7/99	../..	../..	FI; K7=E43
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
84)	4632	TEST116C3	6396	7405					ALU=NOT-A-AND-B; A(000000), B(052525), D(052525), BITS<11:06>=(25)
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
85)	4633	TEST116C2	6381	7402					BUTR(COUNT#D[C]), D[C]=ALU15="0", D=(052525)
					7403	K4/99	../..	../..	FI; K4=E63-E64
86)	4635	TEST116C1	6359	7405					ALU=NOT-A-AND-B; A(000000), B(052525), D(052525), BITS<15:12>=(05)
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
87)	4636	TEST116A5	6305	7403					BUTR(D[C]#BA00), D[C]=D[C]="1"
					4747	K2/99	../..	../..	FI; K2=E46,E55
					7401	K4/90	K3/10	../..	FI; K4=E2-E3,E56,E63-E64,E93,E104,E113-E114; K3=E44,E62
88)	4637	TEST116A4	6288	7425					ALU=NOT-A-AND-B; A(000000), B(125252), D(125252), BITS<05:00>=(52)
					7420	K4/99	../..	../..	FI; K4=E40,E88
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
89)	4640	TEST117B2	6592	7412					ALU=A-AND-NOT-B; A(177777), B(052525), D(125252), BITS<11:06>=(52)
					7400	K4/99	../..	../..	FI; K4=E108
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
90)	4641	TEST117B1	6570	7412					ALU=A-AND-NOT-B; A(177777), B(052525), D(125252), BITS<15:12>=(12)
					7400	K4/99	../..	../..	FI; K4=E4,E10,E23-E24
					7410	K4/99	../..	../..	FI; K4=E80
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
91)	4642	TEST117A4	6549	7413					BUTR(X#D[C]#XX), D[C]=CINMUX=D[C]="0", ALU=A-AND-NOT-B
					7417	K3/65	K4/35	../..	FI; K3=E71,E75; K4=E63
					7433	K3/99	../..	../..	FI; K3=E68
					7453	K3/99	../..	../..	FI; K3=E70
					7513	K3/99	../..	../..	FI; K3=E70
					7613	K3/99	../..	../..	FI; K3=E70
					7653	K3/99	../..	../..	FI; K3=E70
92)	4643	TEST117A3	6534	7432					ALU=A-AND-NOT-B; A(177777), B(125252), D(052525), BITS<05:00>=(25)
					7420	K4/65	K3/35	../..	FI; K4=E88-E89; K3=E61
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
93)	4644	TEST117A2	6517	7405					ALU=A-AND-NOT-B; A(177777), B(125252), D(052525), BITS<11:06>=(25)
			[Continued]		7402	K7/99	../..	../..	FI; K7=E37

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
	4644	TEST117A2	[Continued]						ALU=A-AND-NOT-B; A(177777), B(125252), D(052525), BITS<11:06>=(25)
					7434	K5/99	../..	../..	FI; K5=E95
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
94)	4645	TEST116D		6452	7434				ALU=ZERO; A(052525), B(125252), D(000000)
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
95)	4647	TEST117A1		6495	7405				ALU=A-AND-NOT-B; A(177777), B(125252), D(052525), BITS<15:12>=(05)
					7400	K4/85	K3/15	../..	FI; K4=E5,E12,E21,E23; K3=E71
					7417	K3/99	../..	../..	FI; K3=E84
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
96)	4650	TEST120B4		6799	7402				BUTR(COUNT#D[C]), D[C]=CINMUX="0", ALU=A-AND-B
					7403	K3/99	../..	../..	FI; K3=E71
97)	4651	TEST120B3		6784	7432				ALU=A-AND-B; A(052525), B(177777), D(052525), BITS<05:00>=(25)
					7420	K4/99	../..	../..	FI; K4=E40,E88
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
98)	4652	TEST120B2		6767	7405				ALU=A-AND-B; A(052525), B(177777), D(052525), BITS<11:06>=(25)
					7400	K4/99	../..	../..	FI; K4=E41-E42
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
99)	4653	TEST120B1		6745	7405				ALU=A-AND-B; A(052525), B(177777), D(052525), BITS<15:12>=(05)
					7412	K4/99	../..	../..	FI; K4=E13,E15,E20,E22,E24,E31-E34,E40-E43
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
100)	4654	TEST120A3		6724	7425				ALU=A-AND-B; A(125252), B(177777), D(125252), BITS<05:00>=(52)
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
101)	4655	TEST120A2		6707	7412				ALU=A-AND-B; A(125252), B(177777), D(125252), BITS<11:06>=(52)
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
102)	4656	TEST117C1		6633	7434				ALU=A-AND-NOT-B; A(000000), B(000000), D(000000)
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
103)	4657	TEST117B3		6609	7425				ALU=A-AND-NOT-B; A(177777), B(052525), D(125252), BITS<05:00>=(52)
					7420	K4/99	../..	../..	FI; K4=E88-E89
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
104)	4660	TEST121B4		6960	7401				BUTR(D[C]#BA00), D[C]=ALU00="0", D=(125252)
					7403	K4/99	../..	../..	FI; K4=E56,E63
105)	4661	TEST121B3		6945	7425				ALU=A-XOR-B; A(177777), B(052525), D(125252), BITS<05:00>=(52)
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
106)	4662	TEST121B2		6928	7412				ALU=A-XOR-B; A(177777), B(052525), D(125252), BITS<11:06>=(52)
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
107)	4663	TEST121B1	6906	7412	ALU=A-XOR-B; A(177777), B(052525), D(125252), BITS<15:12>=(12)				
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
108)	4665	TEST121A1	6832	7405	ALU=A-XOR-B; A(000000), B(052525), D(052525), BITS<15:12>=(05)				
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
109)	4667	TEST120A1	6685	7412	ALU=A-AND-B; A(125252), B(177777), D(125252), BITS<15:12>=(12)				
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
110)	4671	TEST122A1	7148	7434	ALU=A-IOR-B; A(000000), B(000000), D(000000)				
					7400	K4/99	../..	../..	FI; K4=E1,E7-E8,E11,E13,E22,E92,E96,E100-E102, E109-E112
					7402	K4/99	../..	../..	FI; K4=E7,E10,E21-E22,E101
					7417	K4/99	../..	../..	FI; K4=E110
					7420	K4/99	../..	../..	FI; K4=E22,E102,E112
					7421	K4/99	../..	../..	FI; K4=E22,E112
					7422	K4/99	../..	../..	FI; K4=E112
					7424	K4/99	../..	../..	FI; K4=E21,E112
					7426	K4/99	../..	../..	FI; K4=E102
					7430	K4/99	../..	../..	FI; K4=E102
					7433	K4/99	../..	../..	FI; K4=E102
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
111)	4673	TEST130A1	7283	7434	ALU=A-PLUS-B-PLUS-0; A(052525), B(052525), D(125252)				
					4777	K2/99	../..	../..	FI; K2=E79
					7400	K4/60	K3/40	../..	FI; K4=E1,E6,E49,E64,E88-E89,E98,E101,E108,E110; K3=E35,E42,E82,E92
					7402	K4/70	K3/30	../..	FI; K4=E21,E49,E98,E100-E102,E109-E112; K3=E41,E43, E52-E53,E84
					7420	K4/99	../..	../..	FI; K4=E49,E102,E112
					7421	K4/85	K3/15	../..	FI; K4=E49,E71; K3=E71
					7423	K4/99	../..	../..	FI; K4=E112
					7427	K4/99	../..	../..	FI; K4=E112
					7431	K4/99	../..	../..	FI; K4=E102
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
112)	4674	TEST121A4	6885	7403	BUTR(D[C]#8A00), D[C]=ALU00="1", D=(052525)				
					7401	K4/99	../..	../..	FI; K4=E56,E63,E114
113)	4675	TEST121A3	6871	7432	ALU=A-XOR-B; A(000000), B(052525), D(052525), BITS<05:00>=(25)				
					7420	K4/99	../..	../..	FI; K4=E10
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
114)	4676	TEST121A2	6854	7405	ALU=A-XOR-B; A(000000), B(052525), D(052525), BITS<11:06>=(25)				
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
115)	4677	TEST117C2	6655	7417	BUTR(X#D[C]#XX), D[C]=CINMUX=D[C]="1", ALU=A-AND-NOT-B				
					4756	K3/50	K2/50	../..	FI; K3=E12,E15; K2=E80-E81
					7413	K4/90	K2/10	../..	FI; K4=E2-E3,E56,E63,E104; K2=E1
116)	4701	TEST350	8337	NONE	(NUA SEQUENCING LOGIC ERROR)				
					????	K1/99	../..	../..	INTERNAL DCS ERROR
117)	4705	TEST352A	8670	7434	BSPLO ADDRESSING, USING BSP/RIF ADDRESS=(02)				
					7403	K4/99	../..	../..	FI; K4=E13
					7417	K4/99	../..	../..	FI; K4=E13
					74??	K4/99	../..	../..	K407=BSP-ADDRS-MUX/REG(RIF)
118)	4707	TEST121C1	6987	7412	ALU=A-XOR-B; A(000000), B(125252), D(125252), BITS<15:12>=(12)				
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
119)	4710	TEST763D	18148	7407	BUTR(BG-SERVICE) NEGATED; AFTER INTR DETECTED/SERVICED				
					4747	K5/99	../..	../..	FI; K5=E81-E82
					7403	K7/99	../..	../..	K703=BR-REQUEST-INTR,K704=BR-GRANT-INTR
120)	4711	TEST762F	18031	7403	BUTR(SERVICE) ASSERTED; DL11-W BR6 INTR PRESENT				
					7402	K2/99	../..	../..	FI; K2=E100
121)	4712	TEST351D	8634	7434	ASPHI ADDRESSING, USING ASP/RIF ADDRESS=(05)				
					4747	K2/99	../..	../..	FI; K2=E1
					74??	K4/99	../..	../..	K406=ASP-ADDRS-MUX/REG(RIF)
122)	4713	TEST352B	8692	7434	BSPLO ADDRESSING, USING BSP/RIF ADDRESS=(03)				
					74??	K4/99	../..	../..	K407=BSP-ADDRS-MUX/REG(RIF)
123)	4716	TEST121C4	7040	7417	BUTR(X#D[C]#XX), D[C]=ALU07="1", D=(125252)				
					7413	K4/99	../..	../..	FI; K4=E56,E63
124)	4717	TEST121C3	7025	7425	ALU=A-XOR-B; A(000000), B(125252), D(125252), BITS<05:00>=(52)				
					7420	K4/99	../..	../..	FI; K4=E88
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
125)	4720	TEST763B	18108	7402	VECTOR LOADED FROM DL11-W LINE CLOCK; CHECK=(000100)				
					7400	K7/85	K6/15	../..	FI; K7=E13,E17,E20-E21,E28; K6=E34
126)	4721	TEST763C	18128	7401	BUTR(VECTOR-LOAD) NEGATED; AFTER INTR DETECTED/SERVICED				
					7403	K7/80	K6/20	../..	FI; K7=E10,E21,E94; K6=E26
127)	4722	TEST351B	8591	7434	ASPLO ADDRESSING, USING ASP/RIF ADDRESS=(03)				
					74??	K4/99	../..	../..	K406=ASP-ADDRS-MUX/REG(RIF)

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
128)	4723	TEST351C	8612	7434	ASPHI ADDRESSING, USING ASP/RIF ADDRESS=(04)				
					4777	K2/99	../..	../..	FI; K2=E1
					7271	K2/99	../..	../..	FI; K2=E28
					7400	K4/99	../..	../..	FI; K4=E14
					74??	K4/99	../..	../..	K406=ASP-ADDRS-MUX/REG(RIF)
129)	4724	TEST352C	8713	7434	BSPHI ADDRESSING, USING BSP/RIF ADDRESS=(04)				
					7400	K4/99	../..	../..	FI; K4=E12
					74??	K4/99	../..	../..	K407=BSP-ADDRS-MUX/REG(RIF)
130)	4725	TEST352D	8735	7434	BSPHI ADDRESSING, USING BSP/RIF ADDRESS=(05)				
					74??	K4/99	../..	../..	K407=BSP-ADDRS-MUX/REG(RIF)
131)	4726	TEST121D2	7083	7405	ALU=A-XOR-B; A(177777), B(125252), D(052525), BITS<11:06>=(25)				
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
132)	4727	TEST121D1	7061	7405	ALU=A-XOR-B; A(177777), B(125252), D(052525), BITS<15:12>=(05)				
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
133)	4730	TEST762E	18006	7402	DL11-W BR6 INTR PENDING, LAST BUS DATO; SERVICE=(043740)				
					7400	K3/99	../..	../..	FI; K3=E50
					7401	K2/99	../..	../..	FI; K2=E100
					740?	K7/99	../..	../..	K708=STATUS-MUX
134)	4732	TEST351A	8569	7434	ASPLO ADDRESSING, USING ASP/RIF ADDRESS=(02)				
					7400	K4/99	../..	../..	FI; K4=E9,E14
					7402	K7/99	../..	../..	FI; K7=E52
					7403	K4/65	K2/35	../..	FI; K4=E15,E86; K2=E52
					7417	K4/99	../..	../..	FI; K4=E4,E15
					74??	K4/99	../..	../..	K406=ASP-ADDRS-MUX/REG(RIF)
135)	4734	TEST122A3	7188	7402	BUT(D<14:00>=0#D15), D=(000000), TARGET="10"				
					7400	K2/95	K3/5	../..	FI; K2=E40,E56,E88-E89,E94-E96,E104-E105; K3=E56, E66
					7403	K3/99	../..	../..	FI; K3=E54,E95
					7406	K3/99	../..	../..	FI; K3=E74
136)	4735	TEST122A4	7202	7401	BUT(D<14:00>=0#D15), D=(125252), TARGET="01"				
					7400	K3/99	../..	../..	FI; K3=E54-E55,E63,E95
					7403	K2/85	K3/15	../..	FI; K2=E40,E56,E90; K3=E56
137)	4736	TEST121D4	7115	7413	BUTR(X#D[C]#XX), D[C]=ALU07="0", D=(052525)				
					7417	K4/99	../..	../..	FI; K4=E56,E63

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
138)	4737	TEST121D3	7100	7432	ALU=A-XOR-B; A(177777), B(125252), D(052525), BITS<05:00>=(25)				
					7434	K2/99	../..	../..	FI; K2=E2
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
139)	4740	TEST762C	17946	7403	BUTR(BG-SERVICE) ASSERTED; BR6 INTR PENDING, PROC PRIO=(5)				
					7407	K7/99	../..	../..	FI; K7=E3,E5,E11,E20,E25
140)	4741	TEST762D	17980	7417	BUTR(BGSERVICE+FPSERVICE) ASSERTED; BR6 INTR PRESENT				
					7407	K3/80	K7/20	../..	FI; K3=E50,E76; K7=E80
141)	4742	TEST350C	8471	7434	ASPLO ADDRESSING, USING ASP/DF ADDRESS FROM (7):(0)				
					7400	K4/80	K3/20	K5/5	K2/5 FI; K4=E1,E5,E7,E10,E15-E16,E23,E25,E31-E34, E40-E43,E99,E110; K3=E45-E47,E59; K5=E63; K2=E55
					7402	K4/65	K3/35	K6/5	FI; K4=E1,E6,E15,E17,E22,E33,E86,E92,E99-E102, E109-E112; K3=E19,E24-E26,E45,E47; K6=E40
					7403	K3/99	../..	../..	FI; K3=E59
					7406	K4/60	K3/40	../..	FI; K4=E6; K3=E46
					7417	K4/99	../..	../..	FI; K4=E43
					7420	K4/99	../..	../..	FI; K4=E25,E31-E32,E102,E112
					7421	K4/99	../..	../..	FI; K4=E31
					7422	K4/99	../..	../..	FI; K4=E31
					7424	K4/99	../..	../..	FI; K4=E31
					7426	K4/99	../..	../..	FI; K4=E32
					7430	K4/99	../..	../..	FI; K4=E32
142)	4743	TEST350D	8499	7434	ASPHI ADDRESSING, USING ASP/SF ADDRESS FROM (0):(7)				
					7400	K4/99	../..	../..	FI; K4=E6-E7,E14,E17,E42,E99-E100,E109
					7402	K4/75	K3/25	../..	FI; K4=E17,E34,E99; K3=E45
					7417	K4/99	../..	../..	FI; K4=E15,E109
					7420	K4/99	../..	../..	FI; K4=E40-E41,E74,E92,E99,E111
					7421	K4/99	../..	../..	FI; K4=E111
					7422	K4/99	../..	../..	FI; K4=E111
					7424	K4/99	../..	../..	FI; K4=E111
					7426	K4/99	../..	../..	FI; K4=E92
					7433	K4/99	../..	../..	FI; K4=E99
143)	4744	TEST740A	17556	7402	INSTR1*-PREFETCH, BC<0>=BC<0>				
					4747	K2/99	../..	../..	FI; K2=E24
					7401	K2/99	../..	../..	FI; K2=E105
					7403	K5/99	../..	../..	FI; K5=E97
144)	4745	TEST761A	17726	7402	BUTR(SERVICE) NEGATED; AFTER CLEAR ALL SERVICE CONDITIONS, UNIBUS INIT				
					4747	K7/99	../..	../..	FI; K7=E57
					7403	K7/99	../..	../..	K707/9=UNIBUS-UCON-INIT,K704=BG-GRANT-INTR

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
145)	4750	TEST131B2	7474	7413	BUTR(X#D[C]#XX), D[C]=COUT15="0"; A(0)+B(1)+CI(0)=D(1)+CO(0)				
					7403	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
146)	4751	TEST762B	17924	7407	BUTR(BG-SERVICE) NEGATED; BR6 INTR PENDING, PROC PRIO=(6)				
					7403	K7/99	../..	../..	FI; K7=E11,E76
					740?	K7/99	../..	../..	K703=BR-REQUEST-INTR
147)	4752	TEST350A	8417	7434	BSPL0 ADDRESSING, USING BSP/SF ADDRESS FROM (0):(7)				
					7400	K4/90	K2/10	../..	FI; K4=E1,E5,E7-E9,E12,E14,E17,E21,E26,E35,E92, E99-E102,E109-E112; K2=E38,E55
					7402	K4/99	../..	../..	FI; K4=E22,E100
					7403	K4/99	../..	../..	FI; K4=E47
					7407	K4/99	../..	../..	FI; K4=E20
					7410	K4/99	../..	../..	FI; K4=E6,E13
					7413	K7/99	../..	../..	FI; K7=E25
					7417	K4/99	../..	../..	FI; K4=E4,E13,E15,E17,E22,E26,E109
					7420	K4/99	../..	../..	FI; K4=E92,E111
					7421	K4/99	../..	../..	FI; K4=E111
					7422	K4/99	../..	../..	FI; K4=E111
					7424	K4/99	../..	../..	FI; K4=E111
					7426	K4/99	../..	../..	FI; K4=E92
					7430	K4/99	../..	../..	FI; K4=E92
					7431	K4/99	../..	../..	FI; K4=E92,E99,E111
148)	4753	TEST350B	8444	7434	BSPH1 ADDRESSING, USING BSP/DF ADDRESS FROM (7):(0)				
					7400	K4/80	K2/15	K7/5 K5/5	FI; K4=E6-E7,E11-E15,E17,E21-E22,E26,E55, E87,E96,E101,E110; K2=E32,E44,E50,E53; K7=E66; K5=E66
					7417	K4/85	K5/15	../..	FI; K4=E13,E15,E22; K5=E66
					7420	K4/99	../..	../..	FI; K4=E102,E112
149)	4755	TEST731A	17321	7402	BUS DATOB*BYTE*ODD, BA=(000001); DBUF=D=(000000)				
					4415	K2/99	../..	../..	FI; K2=E30
					4747	K6/65	K2/35	../..	FI; K6=E5; K2=E18
					????	K6/99	../..	../..	K605=UNIBUS-FUNCTION-DECODE
150)	4760	TEST720C	16813	7402	DATIB*-BYTE, 16. BIT PBA, -I/O PAGE(3); SERVICE=(100340)				
					7400	K6/99	../..	../..	FI; K6=E59
151)	4761	TEST763A	18062	4733	ALLOW-BG[1]H GIVEN TO BR6 INTR; BUTR (VECTOR-LOAD) ASSERTED				
					####	../..	../..	../..	!! ALSO CHECK GRANT CONTINUITY CARD !!
					4731	K7/95	K2/5	K6/5 K5/5	FI; K7=E4-E5,E8,E10,E12-E13,E17-E18,E20-E22, E25,E29,E33,E35,E37,E41,E51,E59,E61,E76-E77,E79, E94,E101; K2=E70; K6=E56; K5=E53
					4756	K7/99	../..	../..	FI; K7=E6-E7

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
152)	4771	TEST761B	17765	7401	BUTR(VECTOR-LOAD) NEGATED; AFTER UNIBUS INIT				
					7403	K7/99	../..	../..	K707/9=UNIBUS-UCON-INIT,K704=BG-GRANT-INTR
					7403	K3/99	../..	../..	FI; K3=E44
153)	4773	TEST762A	17829	4343	(NUA SEQUENCING LOGIC ERROR)				
					4747	K6/75	K5/20	K7/5	K4/5 FI; K6=E11,E19,E25,E29,E33,E49-E50; K5=E2, E10,E33,E80,E82,E97; K7=E66; K4=E48
154)	4774	TEST761C	17786	7407	BUTR(BG-SERVICE) NEGATED; AFTER UNIBUS INIT				
					7403	K7/99	../..	../..	K707/9=UNIBUS-UCON-INIT,K704=BG-GRANT-INTR
155)	4775	TEST010	2802	5245	BUTA(SUBR-B) -> BUTA(RETURN) SEQUENCE, RETURN="1010 1010 0101"=(5245)				
					4245	K2/65	K3/35	../..	FI; K2=E35,E41,E61,E77,E85; K3=E4,E7,E15,E43
					4376	K2/90	K3/15	../..	FI; K2=E33,E35,E39-E40,E45-E46,E51,E54; K3=E34
					4777	K2/99	../..	../..	FI; K2=E5,E13-E14,E41,E57,E63,E82,E85-E86,E91-E92, E97,E106,E110,E116,E118
					5005	K2/99	../..	../..	FI; K2=E25
					5045	K2/85	K4/15	../..	FI; K2=E7,E13,E25,E31,E37,E43,E49,E52,E70,E97; K4=E12-E13
					5105	K2/99	../..	../..	FI; K2=E13
					5125	K2/99	../..	../..	FI; K2=E13
					5205	K2/90	K4/15	../..	FI; K2=E4,E7,E10,E13,E16,E22,E25,E28,E71,E97; K4=E1
					5240	K2/99	../..	../..	FI; K2=E26
					5241	K2/85	K4/15	../..	FI; K2=E4,E8,E10,E14,E16,E22,E26,E28,E62,E91; K4=E20,E86
					5242	K2/99	../..	../..	FI; K2=E14
					5244	K2/70	K4/30	../..	FI; K2=E8,E14,E26,E58,E64,E67,E71,E73,E79,E91; K4=E12,E14
					5245	K2/85	K4/15	../..	FI; K2=E25,E31,E35,E37,E43,E49,E52,E58,E62,E64,E67, E73,E77,E79,E91,E97; K4=E3,E70
					5247	K2/99	../..	../..	FI; K2=E8,E14,E26
					5252	K2/99	../..	../..	FI; K2=E14
					5255	K2/99	../..	../..	FI; K2=E8,E14,E26
					5256	K2/99	../..	../..	FI; K2=E8
					5257	K2/99	../..	../..	FI; K2=E14
					5265	K2/99	../..	../..	FI; K2=E7,E13,E25
					5345	K2/99	../..	../..	FI; K2=E7,E13,E25
					5365	K2/99	../..	../..	FI; K2=E7,E13
					5376	K2/99	../..	../..	FI; K2=E40
					7245	K2/99	../..	../..	FI; K2=E35,E41,E77
					7247	K2/99	../..	../..	FI; K2=E40
					7273	K3/55	K2/45	../..	FI; K3=E4,E6-E7,E11,E15,E43; K2=E61,E77,E85
					7401	K2/99	../..	../..	FI; K2=E41
					7777	K2/99	../..	../..	FI; K2=E11

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
156)	5146	TEST005	2711	4474	NUA SEQUENCING, PAGE (5) -> (4), UBF=(34)				
					4574	K3/50	K2/50	../..	FI; K3=E58; K2=E7
					5441	K3/60	K2/40	../..	FI; K3=E10,E18,E20; K2=E30,E54
157)	5463	TEST722A	16951	4777	INVALIDATE, ODD ADDR JAM, BA=(140001)				
					7341	K6/75	K4/15	K3/15	FI; K6=E71,E76,E81,E88,E96; K4=E51; K3=E11
					????	K6/99	../..	../..	K6OS=UNIBUS-FUNCTION-DECODE
158)	5465	TEST720A	16730	4777	DATIB*-BYTE, ODD ADDR JAM, BA=(060001)				
					7341	K5/50	K3/50	../..	FI; K5=E67,E94; K3=E34
					????	K6/99	../..	../..	K6OS=UNIBUS-FUNCTION-DECODE
159)	5467	TEST713A	16594	4777	DATI-NOINT, ILLEGAL INTERNAL ADDR JAM, BA=(177776)				
					????	K6/99	../..	../..	K6OS=UNIBUS-FUNCTION-DECODE,INTERNAL-ADDR-DETECT
160)	5471	TEST712A	16460	4777	DATI, INTERNAL ADDRESS JAM, BA=(177776)				
					????	K6/99	../..	../..	K6OS=UNIBUS-FUNCTION-DECODE,INTERNAL-ADDR-DETECT
161)	5473	TEST711A	16328	4777	DATOB*BYTE, SSYN TIMEOUT JAM, BA=(160001)				
					7341	K6/70	K4/20	K7/5	K5/5 FI; K6=E4,E11,E25,E62,E64,E78-E79,E98-E99, E101-E102; K4=E18,E28; K7=E60; K5=E55
					????	K6/99	../..	../..	K6OS=UNIBUS-FUNCTION-DECODE
162)	5475	TEST710A	16157	4777	DATO, ODD ADDRESS ERROR JAM, BA=(160001)				
					4747	K6/99	../..	../..	FI; K6=E60
					7341	K6/75	K7/15	K4/10	K5/5 K3/5 FI; K6=E2,E4,E10,E38,E40,E42-E43, E46-E47,E54-E56,E60,E64,E69,E71-E72,E76,E79,E81, E89,E95,E98-E99,E103,E108; K7=E22,E25,E39,E43, E45-E46,E65; K4=E9,E18,E26,E30,E71; K5=E44,E64; K3=E52
					7401	K5/99	../..	../..	FI; K5=E97
					7445	K6/99	../..	../..	FI; K6=E43
					????	K6/99	../..	../..	K6OS=UNIBUS-FUNCTION-DECODE
163)	5477	TEST702A	16040	7402	LOAD BA<17:16>="01", 18. BIT MODE, READ THRU STATUS-MUX(SERVICE)<9:8>				
					4747	K2/99	../..	../..	FI; K2=E34
					7400	K6/40	K5/25	K4/20	K7/10 K2/5 FI; K6=E11,E51-E54,E59; K5=E4,E13, E15,E26,E54,E84,E97; K4=E20,E65; K7=E48,E56; K2=E61
164)	5500	TEST374D2	10178	7434	A/B SP WRITE FCN WR(B,HI,A-ADDR) AND WR(B,HI,B-ADDR)				
					74??	K4/99	../..	../..	K4OS=SP-REWRITE-CNTL,K406/7=A/B-SPADS
165)	5502	TEST374E2	10251	7434	A/B SP WRITE FCN WR(AB,LO,A-ADDR) AND WR(AB,LO,B-ADDR)				
			[Continued]		7400	K2/99	../..	../..	FI; K2=E117

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
	5502	TEST374E2	[Continued]		A/B SP WRITE FCN WR(AB,LO,A-ADDR) AND WR(AB,LO,B-ADDR)				
					7420	K4/99	../..	../..	FI; K4=E10
					74??	K4/99	../..	../..	K405=SP-REWRITE-CNTL,K406/7=A/B-SPADS
166)	5504	TEST374F2	10324	7434	A/B SP WRITE FCN WR(AB,HI,A-ADDR) AND WR(AB,HI,B-ADDR)				
					74??	K4/99	../..	../..	K405=SP-REWRITE-CNTL,K406/7=A/B-SPADS
167)	5505	TEST712B	16512	7402	DATI, INTERNAL ADDR; JAM=(001000)				
					7400	K6/70	K7/15	K3/15 K5/5	FI; K6=E46,E49-E51,E81,E99; K7=E19,E58,E61, E81; K3=E48,E69; K5=E13,E72
					7401	K6/99	../..	../..	FI; K6=E76
					????	K6/99	../..	../..	K605=INTERNAL-ADDR-DETECT
168)	5507	TEST410	10666	NONE	(NUA SEQUENCING LOGIC/DCS ERROR)				
					????	K1/99	../..	../..	INTERNAL DCS ERROR
169)	5511	TEST620A	15262	7406	BUTM(INIT-JAM) NEGATED="0" AFTER CLR-JAM-ERRORS UCON				
					7407	K7/90	K2/10	../..	FI; K7=E18,E41,E51; K2=E112
170)	5512	TEST701D	16011	7402	BUTR(D[C]#BA00), BA<00>="0"				
					7403	K3/99	../..	../..	FI; K3=E64
171)	5513	TEST376A	10595	5440	BUTA(R-IOR-1) DOES NOT CAUSE A BRANCH				
					5441	K3/99	../..	../..	FI; K3=E64
172)	5517	TEST375A	10512	7432	DAD/3 CAUSES BYTE-WRITE(LO) TO ASPLO; DAD/1 OR DAD/2 NOT				
					7400	K3/80	K4/20	../..	FI; K3=E17,E20,E36,E38,E46; K4=E5,E99
					7402	K3/85	K4/15	../..	FI; K3=E27,E36,E38,E46,E49,E59-E60; K4=E5,E33
					7433	K4/99	../..	../..	FI; K4=E25
					7434	K3/99	../..	../..	FI; K3=E59
173)	5521	TEST102A	5225	7432	CSP ADDRESS, LOC(02); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(000125)				
					7400	K4/60	K3/40	../..	FI; K4=E47,E55,E88-E89,E95-E96,E98,E105,E108; K3=E5,E8-E10,E14,E32,E35,E42,E92
					7402	K4/70	K3/30	../..	FI; K4=E55,E95,E98; K3=E12-E13,E32,E35,E42
					7403	K4/99	../..	../..	FI; K4=E96
					7410	K3/75	K4/25	../..	FI; K3=E1-E3,E5,E13-E14,E42; K4=E1,E30
					7417	K4/99	../..	../..	FI; K4=E105,E108
					7420	K4/70	K6/10	K2/10 K3/5 K7/5 K5/5	FI; K4=E1,E4,E7-E8,E11-E12, E31-E32,E35,E40-E41,E52,E56,E65-E66,E72,E74,E79, E88-E92,E96,E100-E102,E105-E106,E109-E112; K6=E65,E67,E73,E75,E108; K2=E83,E94,E98,E100, E102-E104,E107-E108,E111,E113-E114; K3=E72; K7=E85-E86; K5=E63,E66
					7421	K4/99	../..	../..	FI; K4=E87
					7427	K6/55	K4/30	K7/15	FI; K6=E73; K4=E89; K7=E37
					7433	K4/90	K3/15	../..	FI; K4=E89,E105; K3=E8
			[Continued]		7434	K4/75	K3/10	K6/10 K7/5 K2/5	FI; K4=E1-E5,E7,E9-E11,E18,E20-E26,

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	5521	TEST102A	[Continued]		CSP ADDRESS, LOC(02); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(000125)				
					7434	K4/75	K3/10	K6/10	E28-E30,E38,E47,E51,E55-E56,E59,E64,E66,E70-E71, E74,E87-E89,E96,E98-E99,E108; K3=E2-E3,E12,E35, E42-E43,E53,E59,E82,E84; K6=E31,E34,E42,E82, E103; K7=E76; K2=E102
174)	5523	TEST701B	15962	7403	BUTR(D[C]#BA00), BA<00>="1"				
					7402	K3/99	../..	../..	K308=MICROBRANCH
175)	5524	TEST374C2	10105	7434	A/B SP WRITE FCN WR(B,LO,A-ADDR) AND WR(B,LO,B-ADDR)				
					7400	K3/99	../..	../..	FI; K3=E45
					7402	K4/99	../..	../..	FI; K4=E10,E17,E21-E22
					7420	K3/99	../..	../..	FI; K3=E93
					7421	K4/99	../..	../..	FI; K4=E21-E22
					74??	K4/99	../..	../..	K405=SP-REWRITE-CNTL,K406/7=A/B-SPADS
176)	5525	TEST004	2692	5146	NUA SEQUENCING, NO 'BUT'				
					5147	K3/99	../..	../..	FI; K3=E38
					5156	K3/99	../..	../..	FI; K3=E37
					5346	K3/99	../..	../..	FI; K3=E23
177)	5531	TEST103A	5370	7412	CSP ADDRESS, LOC(13); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(125200)				
					7400	K4/99	../..	../..	FI; K4=E59,E66,E74,E92,E102,E109-E112
178)	5533	TEST61081	14869	7413	PS[CC]=(13); IR=(105300), CC-ROM-ADDR(132)				
					7401	K3/99	../..	../..	FI; K3=E55
					7403	K3/99	../..	../..	FI; K3=E63,E72
					7411	K3/90	K4/10	../..	FI; K3=E55,E62,E65,E85; K4=E72
					7417	K3/60	K2/40	../..	FI; K3=E55,E72; K2=E105
179)	5535	TEST610C1	14987	7407	PS[CC]=(07); IR=(072000), CC-ROM-ADDR(437)				
					7405	K3/99	../..	../..	FI; K3=E33
					7406	K3/99	../..	../..	FI; K3=E62
					7415	K2/99	../..	../..	FI; K2=E8
180)	5541	TEST105A	5592	7432	SR LOAD/READ, SR=(000125), RES=SR/LOAD; ALU-A/D/DBUF/IR PATH				
					7400	K4/85	K3/10	K2/5	FI; K4=E1,E3,E11,E16,E18,E20,E27,E30,E35-E36, E45-E47,E52,E80; K3=E5,E10,E14,E51,E66; K2=E89
					7402	K4/85	K3/10	K2/5	FI; K4=E30,E35,E45-E47; K3=E8,E14; K2=E101
					7403	K4/50	K3/50	../..	FI; K4=E80; K3=E9
					7406	K3/99	../..	../..	FI; K3=E9
					7410	K4/99	../..	../..	FI; K4=E36,E52
					7412	K3/99	../..	../..	FI; K3=E8
					7417	K4/99	../..	../..	FI; K4=E27,E36,E47,E52
					7420	K4/90	K3/10	../..	FI; K4=E1,E3,E7,E11,E16,E20,E26,E31-E32,E34-E35, E37,E40-E42,E44,E47-E48,E52-E54,E57,E60-E62, E67-E68,E75-E76,E80; K3=E41,E43,E51,E67,E71,E75, E82
			[Continued]						

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	5541	TEST105A	[Continued]						SR LOAD/READ, SR=(000125), RES=SR/LOAD; ALU-A/D/DBUF/IR PATH
					7427	K4/99	../..	../..	FI; K4=E1,E7,E16,E33,E35
					7430	K4/99	../..	../..	FI; K4=E1
					7431	K4/99	../..	../..	FI; K4=E36,E45
					7433	K4/99	../..	../..	FI; K4=E35,E37,E47,E66
					7434	K4/99	K3/5	../..	FI; K4=E1,E4,E7,E11,E16,E30-E32,E35-E36,E39,E43, E45,E47-E48,E52-E53,E55,E57,E65,E80; K3=E102
181)	5545	TEST610D1	15101	7410					PS[CC]=(10); IR=(072000), CC-ROM-ADDR(216)
					7412	K3/99	../..	../..	FI; K3=E33,E62
182)	5547	TEST104A	5516	7425					CSP BASCON ADDR, LOC(16); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(000152)
					7400	K4/99	../..	../..	FI; K4=E38,E96
					7417	K4/99	../..	../..	FI; K4=E38
					7420	K4/99	../..	../..	FI; K4=E74,E111-E112
					7434	K3/60	K4/35	K2/5	FI; K3=E1-E3,E12-E13; K4=E1,E30,E38; K2=E70
183)	5551	TEST050A	5077	7405					BUT(INSTR5), IR=(172500); E88(725)=(05)
					74??	K3/99	../..	../..	K305=INSTR5-DECODE
184)	5553	TEST101A	5161	7434					ALU=ZERO, D/DBUF/IR PATH; BUT(INSTR5) FOR IR=ZERO
					7400	K4/65	K6/20	K3/10	K7/5 K2/5 FI; K4=E33-E34,E42-E43,E51,E59,E82, E95,E100-E101,E109-E110; K6=E73,E82,E91,E96; K3=E1,E43,E51,E71,E82; K7=E52,E54; K2=E70
					7402	K4/80	K6/15	K3/5	FI; K4=E33-E34,E51,E82,E95,E100-E101; K6=E91; K3=E13
					7410	K3/99	../..	../..	FI; K3=E43,E82,E102
					7411	K6/99	../..	../..	FI; K6=E65,E82
					7412	K7/65	K2/30	K3/5	FI; K7=E28,E41,E52,E54,E70; K2=E61,E83; K3=E43
					7417	K6/99	../..	../..	FI; K6=E82
					7420	K4/75	K6/15	K7/5	K5/5 K3/5 K2/5 FI; K4=E31-E32,E38,E40-E41, E47,E55,E66,E74,E79,E92,E102,E111-E112; K6=E65, E73; K7=E41,E48,E65,E70; K5=E14,E54; K3=E82,E84; K2=E34,E85
					7421	K4/90	K6/15	../..	FI; K4=E31,E40,E47,E72,E74,E111-E112; K6=E65
					7422	K7/75	K4/20	K6/5	FI; K7=E6-E7,E15,E23,E31,E45,E48,E65-E67,E69,E74, E78,E91-E92; K4=E31,E40,E72,E74,E111-E112; K6=E43,E65
					7424	K4/80	K6/20	../..	FI; K4=E31,E40,E74,E79,E111-E112; K6=E65
					7426	K6/50	K3/50	../..	FI; K6=E73; K3=E51,E82
					7427	K4/99	../..	../..	FI; K4=E74
					7431	K3/99	../..	../..	FI; K3=E43
					74??	K4/90	K3/10	../..	K404=ALU/CARRY-LOOKAHEAD; K313=ALU-FCN-DECODE
185)	5554	TEST102D	5330	7425					CSP ADDRESS, LOC(01); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(000152)
					7400	K4/99	../..	../..	FI; K4=E4
					7402	K5/99	../..	../..	FI; K5=E44
			[Continued]		7420	K4/60	K6/10	K3/5	K2/5 K5/5 K7/5 FI; K4=E35,E52,E65-E66,E72,

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
	5554	TEST102D	[Continued]		CSP ADDRESS, LOC(01); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(000152)				
					7420	K4/60	K6/10	K3/5	E74,E79,E88-E92,E102,E106,E111-E112; K6=E65,E67, E73,E75; K3=E72; K2=E94,E104; K5=E66,E106; K7=E85-E86
					7434	K4/99	../..	../..	FI; K4=E38,E70,E88-E89,E98,E108
186)	5561	TEST047A	4988	7412	BUT(INSTR5), IR=(122566); E88(325)=(12)				
					7400	K3/99	../..	../..	FI; K3=E88
					7405	K3/99	../..	../..	FI; K3=E88
					7413	K3/99	../..	../..	FI; K3=E88
					7416	K3/99	../..	../..	FI; K3=E88
187)	5563	TEST701A	15925	7402	LOAD BA<15:00>=(052525), READ THRU BA/KT-ALU/PBA/STATUS-MUX(PBA)				
					7400	K5/55	K6/15	K7/15	K4/15 K3/5 FI; K5=E3,E7,E9-E11,E13,E25,E27,E30, E32,E37-E39,E43,E45-E47,E50,E58-E60,E65-E67, E69-E70,E72,E79-E82,E93-E94; K6=E19,E25,E29,E33, E36,E38,E49,E54,E59,E70,E76,E90,E96,E104,E108; K7=E48,E56,E64-E65,E73,E80-E82,E88; K4=E29,E39, E48,E57,E65,E87; K3=E9,E14,E33,E64
					7401	K4/45	K3/35	K6/20	FI; K4=E57,E65,E87; K3=E5,E8,E10,E33; K6=E31
					7403	K7/50	K4/50	../..	FI; K7=E80; K4=E39
188)	5564	TEST102C	5303	7412	CSP ADDRESS, LOC(04); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(125200)				
					7400	K4/65	K6/15	K2/10	K5/5 K3/5 FI; K4=E35-E36,E45,E51,E56,E59,E66, E72,E79-E80,E82,E89,E91-E92,E95,E98,E100-E102, E105,E108-E110; K6=E73,E75,E82,E84,E91,E93; K2=E95-E96,E104; K5=E53,E63; K3=E56,E95
					7403	K4/75	K6/25	../..	FI; K4=E45,E51,E64; K6=E91
					7405	K4/99	../..	../..	FI; K4=E98
					7420	K3/99	../..	../..	FI; K3=E17,E20,E27,E36
					7432	K3/99	../..	../..	FI; K3=E32
					7434	K4/75	K2/25	../..	FI; K4=E29,E38,E70,E88-E89,E98,E108; K2=E5,E11,E17, E23,E29,E84
189)	5565	TEST624B	15817	7434	CLOCKING D REGISTER PROPOGATED THRU MICROBREAK JAM (P2-T)				
					74??	K4/99	../..	../..	K403/4=U-CLKD-CNTRL
190)	5571	TEST624A	15724	4777	MICROBREAK JAM AT MICROADDRESS=(6255); FLAG<8> CLEARED IN JAM WORD				
					????	K3/99	../..	../..	K311=MICROBREAK-LOGIC
191)	5572	TEST103B	5423	7432	CSP ADDRESS, LOC(15); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(000125)				
					7411	K2/80	K3/20	../..	FI; K2=E2,E8-E9,E21,E27,E60,E66,E69,E75,E81; K3=E21-E22,E76
					7415	K3/99	../..	../..	FI; K3=E21
					7420	K4/99	../..	../..	FI; K4=E74,E111-E112
192)	5573	TEST623	15680	7402	BUTA(CUA-TRACK) RESETS CUA TO TRACKING NUA VALUE				
			[Continued]		4747	K3/99	../..	../..	FI; K3=E91

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	5573	TEST623	[Continued]		BUTA(CUA-TRACK) RESETS CUA TO TRACKING NUA VALUE				
					7400	K2/99	../..	../..	FI; K2=E3,E6,E9,E18,E24-E25,E30,E33,E39,E45,E51, E54,E60,E66,E75,E81,E86-E87,E113
193)	5574	TEST102B	5277	7405	CSP ADDRESS, LOC(10); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(152500)				
					7400	K4/65	K6/30	K2/5	K5/5 FI; K4=E36,E38,E42-E43,E51,E59,E82,E89,E98, E105,E108-E110; K6=E82,E84,E91; K2=E96; K5=E63
					7402	K4/65	K6/15	K5/10	K2/10 K3/5 FI; K4=E45,E51,E64,E78,E95,E98, E100-E101; K6=E91,E93; K5=E53; K2=E95; K3=E95
					7403	K2/99	../..	../..	FI; K2=E34
					7412	K4/99	../..	../..	FI; K4=E89,E92,E102,E106
					7434	K4/90	K7/5	K3/5	K2/5 FI; K4=E4,E38,E70,E88-E89,E98-E99,E108; K7=E21; K3=E102; K2=E84
194)	5575	TEST622C	15657	7402	CLR-JAM-ERRORS RESETS STATUS-MUX(JAM)=(001000) AFTER UBREAK JAMUPP				
					740?	K7/99	../..	../..	K705=UBRK-JAM-FLAGS,K707=JAM-CLEAR,K708=STATUS-MUX
195)	5576	TEST103C	5449	7425	CSP ADDRESS, LOC(16); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(000152)				
					7402	K4/99	../..	../..	FI; K4=E100-E101
					7420	K3/99	../..	../..	FI; K3=E93
196)	5577	TEST622B	15634	7401	BUTR(OTHER-JAM) NEGATED="0" AFTER CLR-JAM-ERRORS				
					7403	K7/99	../..	../..	FI; K7=E51-E52,E57
197)	5600	TEST105B1	5666	7412	BUT(SR3-0), SR=(000152); SR<3:0>="1010"				
					7410	K4/99	../..	../..	FI; K4=E44
					7413	K3/99	../..	../..	FI; K3=E67
					7416	K3/99	../..	../..	FI; K3=E75
198)	5601	TEST622A	15605	7403	UCONS 'START-DELAY' & 'CLR-NPR-TIMEOUT' DONT EFFECT 'CLR-JAM-ERRORS'				
					7401	K7/99	../..	../..	FI; K7=E36
199)	5602	TEST610C2	15038	7401	PS[CC]=(01); IR=(072000), CC-ROM-ADDR(037)				
					7403	K3/99	../..	../..	FI; K3=E62
					7405	K3/99	../..	../..	FI; K3=E55,E66
200)	5603	TEST621F	15521	7402	PROC-MUX(CUA-PORT)=(055226); CUA-LOCKED, EXFLAGS SET, PREFETCH*JAM CLEAR				
					7400	K2/99	../..	../..	FI; K2=E46,E55,E90,E100,E105
201)	5604	TEST374A2	9959	7434	A/B SP WRITE FCN WR(A,LO,A-ADDR) AND WR(A,LO,B-ADDR)				
					7400	K4/80	K2/20	../..	FI; K4=E11,E17,E23,E47; K2=E34
					7402	K4/75	K3/25	../..	FI; K4=E17,E26; K3=E93
					7420	K4/70	K2/30	../..	FI; K4=E10,E17,E23-E24,E26; K2=E32,E38,E44,E50,E53
					74??	K4/99	../..	../..	K405=SP-REWRITE-CNTL,K406/7=A/B-SPADS
202)	5605	TEST621E	15495	7402	STATUS-MUX(JAM-PORT)=(001001) AFTER MICROBREAK JAM				
					7400	K2/75	K7/25	../..	FI; K2=E56,E76,E83,E100; K7=E56,E73

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
203)	5606	TEST37482	10032	7434	A/B SP WRITE FCN WR(A,HI,A-ADDR) AND WR(A,HI,B-ADDR)				
					74??	K4/99	../..	../..	K405=SP-REWRITE-CNTL,K406/7=A/B-SPADS
204)	5607	TEST621D	15476	7403	BUTR(OTHER-JAM) ASSERTED="1" AFTER MICROBREAK JAM				
					7401	K7/70	K3/30	../..	FI; K7=E32,E38,E57,E73; K3=E44
205)	5610	TEST105A1	5619	7405	BUT(SR3-0), SR=(000125); SR<3:0>="0101"				
					7407	K3/99	../..	../..	FI; K3=E77
					7415	K3/99	../..	../..	FI; K3=E76
					7425	K3/99	../..	../..	FI; K3=E68
206)	5611	TEST621C	15458	7406	BUTM(INIT-JAM) STAYS NEGATED AFTER MICROBREAK JAM				
					7407	K2/99	../..	../..	FI; K2=E46
207)	5612	TEST61082	14919	7406	PS[CC]=(06); IR=(005300), CC-ROM-ADDR(253)				
					7402	K3/99	../..	../..	FI; K3=E55,E63,E66
					7404	K3/55	K4/45	../..	FI; K3=E55,E65; K4=E78
					7414	K3/99	../..	../..	FI; K3=E55
208)	5613	TEST621B	15440	7402	CLOCKING D-REGISTER PROPAGATED THRU MICROBREAK JAM (P3-T)				
					74??	K4/99	../..	../..	K403/4=U-CLKD-CNTRL
209)	5614	TEST376A1	10619	7434	SP/SF-ADDRESS: FLTPT/BIT02="0"; R-IOR-1/BIT00="1" FORCED				
					7400	K3/40	K2/40	K4/25	FI; K3=E50,E57,E94,E97; K2=E55,E108,E112; K4=E4,E9, E34,E101
					7410	K2/65	K3/35	../..	FI; K2=E95,E118; K3=E47,E96
210)	5615	ERROR621A	15426	0000	MICROBREAK JAMUPP AT (5522) ATTEMPTED; DID NOT OCCUR				
					5615	K3/75	K2/10	K5/10	K6/5 K7/5 FI; K3=E32,E41,E52,E61,E81,E91,E101, E111-E112; K2=E35,E41,E70,E77; K5=E60-E61,E68, E77; K6=E39-E40; K7=E48,E57
211)	5616	TEST713B	16640	7402	DATI-NOINT, ILLEGAL INTERNAL ADDR; JAM=(001040)				
					7400	K6/70	K7/15	K5/15	FI; K6=E46,E51; K7=E74,E88; K5=E38,E72
212)	5617	TEST621A	15344	4777	MICROBREAK JAM AT MICROADDRESS=(5522); ACTIVE-BUT, WR-CSP LATCHES CLEARED				
					4747	K3/99	../..	../..	FI; K3=E91,E111
213)	5620	TEST105E	5743	7415	SR LOAD/READ, SR=(152500); SR<15:12>="1101"				
					7405	K5/99	../..	../..	FI; K5=E60
					7411	K4/75	K6/10	K5/5	K2/5 FI; K4=E33-E34,E39,E45-E46,E51,E54,E78,E95, E98,E100-E101; K6=E91,E93; K5=E53; K2=E95
					7414	K4/85	K6/10	K5/5	K2/5 FI; K4=E33-E34,E36,E39,E45-E46,E51,E62,E80, E82,E95,E98,E100-E101; K6=E91,E93; K5=E53; K2=E95

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
214)	5621	TEST620C	15309	7402	STATUS-MUX(JAM-PORT)=(001000) AFTER CLR-JAM-ERRORS UCON				
					7400	../..	../..	../..	!! MOS BATTERY BACKUP MUST BE GOOD !!
					7400	K7/95	K2/5	K6/5	FI; K7=E48-E49,E52,E56-E58,E64-E66,E73,E80-E82, E88; K2=E37,E64,E66,E70; K6=E51
					7401	K7/85	K2/15	../..	FI; K7=E28,E37; K2=E100
					7403	K7/99	../..	../..	FI; K7=E80
215)	5622	TEST610A2	14806	7406	PS[CC]=(06); IR=(105200), CC-ROM-ADDR(145)				
					7404	K3/90	K4/10	../..	FI; K3=E55,E62,E65,E72,E85; K4=E72
					7407	K3/99	../..	../..	FI; K3=E62,E72
216)	5623	TEST620B	15286	7401	BUTR(OTHER-JAM) NEGATED="0" AFTER CLR-JAM-ERRORS UCON				
					7403	K7/80	K6/20	K3/5	FI; K7=E18,E26,E32,E38,E49,E57-E58,E74; K6=E2-E3, E62,E64,E105; K3=E44
217)	5624	TEST610D2	15145	7410	PS[CC]=(10); IR=(072000), CC-ROM-ADDR(116)				
					7414	K3/99	../..	../..	FI; K3=E63,E66
218)	5625	TEST375B	10563	7432	DAD/3 CAUSES BYTE-WRITE(LO) TO BSPLO; DAD/1 OR DAD/2 NOT				
					7400	K3/99	../..	../..	FI; K3=E46
					7402	K4/99	../..	../..	FI; K4=E99-E100
219)	5627	TEST610A1	14744	7405	PS[CC]=(05); IR=(105200), CC-ROM-ADDR(665)				
					7400	K3/99	../..	../..	FI; K3=E57
					7401	K3/70	K2/30	../..	FI; K3=E55,E72; K2=E105
					7404	K3/99	../..	../..	FI; K3=E62,E72
					7406	K3/99	../..	../..	FI; K3=E62,E65,E85
					7407	K3/80	K4/20	../..	FI; K3=E34,E55,E62,E65,E72; K4=E72
					7411	K3/99	../..	../..	FI; K3=E34,E55,E65
					7412	K3/99	../..	../..	FI; K3=E5,E8-E10,E14,E36,E72
					7415	K3/99	../..	../..	FI; K3=E55,E62-E63,E72
220)	5631	TEST046A	4920	7426	BUT(INSTR5), IR=(000200); E78(200)=(26)				
					6000	K2/99	../..	../..	FI; K2=E47
					7426	K2/99	../..	../..	FI; K2=E25
					74??	K3/99	../..	../..	K305=INSTR5-DECODE
221)	5633	TEST045A	4878	7405	BUT(DMO#SMO#BYTE), IR=(004300); DMO, -SMO, BYTE (SWAB)				
					7404	K3/99	../..	../..	FI; K3=E85
222)	5635	TEST044A	4833	7447	BUT(INSTR1), IR=(076250), CLASS-A(XFC)				
					7417	K3/99	../..	../..	FI; K3=E90,E99
					7464	K3/99	../..	../..	FI; K3=E90,E110

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
223)	5636	TEST105D	5716	7405	SR LOAD/READ, SR=(152500); ALU-A/D/DBUF/IR PATH				
					7400	K4/99	../..	../..	FI; K4=E27,E35-E36,E39,E42-E43,E48,E67
					7402	K2/95	K4/5	../..	FI; K2=E6,E9,E12,E18,E26,E30,E33,E39,E45,E51,E54, E60,E66,E69,E75,E86-E88,E94,E99,E103; K4=E77
224)	5637	TEST043B	4796	7711	BUT(INSTR1), IR=(161707), CLASS-G(DOP*-SMO)				
					5126	K6/99	../..	../..	FI; K6=E42
					7710	K3/99	../..	../..	FI; K3=E105
					7717	K3/99	../..	../..	FI; K3=E107
					7750	K3/99	../..	../..	FI; K3=E90
225)	5641	TEST043A	4767	7404	BUT(DMO*SMO*BYTE), IR=(161707); DMO, -SMO, -BYTE (SUB)				
					7400	K3/99	../..	../..	FI; K3=E74
					7406	K3/99	../..	../..	FI; K3=E109
226)	5642	TEST105C	5690	7412	SR LOAD/READ, SR=(125200); ALU-A/D/DBUF/IR PATH				
					7400	K4/99	../..	../..	FI; K4=E27,E32-E37,E39,E41-E43,E45-E46,E48,E60,E62, E67-E68,E72
					7403	K4/99	../..	../..	FI; K4=E33-E34,E39,E45-E46,E54,E64,E77-E78
					7405	K4/99	../..	../..	FI; K4=E45-E46
					7420	K4/99	../..	../..	FI; K4=E28
					7434	K4/99	../..	../..	FI; K4=E29
227)	5643	TEST042B	4731	7714	BUT(INSTR1), IR=(144020), CLASS-G(DOP*-SMO)				
					7417	K3/99	../..	../..	FI; K3=E90,E110
					7514	K3/99	../..	../..	FI; K3=E99
					7614	K3/99	../..	../..	FI; K3=E100
					7710	K3/99	../..	../..	FI; K3=E106,E120
					7715	K2/99	../..	../..	FI; K2=E77
					7717	K3/99	../..	../..	FI; K3=E97,E105-E107
228)	5645	TEST042A	4703	7401	BUT(DMO*SMO*BYTE), IR=(144020); -DMO, -SMO, BYTE				
					7400	K3/70	K2/30	../..	FI; K3=E54,E60,E65,E85; K2=E19,E41,E77-E78
					7403	K5/50	K3/50	../..	FI; K5=E98; K3=E109
					7406	K2/99	../..	../..	FI; K2=E78
229)	5646	TEST104B	5543	7432	CSP BASCON ADDR, LOC(15); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(000125)				
					7400	K4/99	../..	../..	FI; K4=E38
					7402	K4/99	../..	../..	FI; K4=E51,E100-E101
230)	5647	TEST041B	4667	7517	BUT(INSTR1), IR=(120777), CLASS-B(DOP*-MOV*SMO*-DMO)				
					7617	K3/99	../..	../..	FI; K3=E115
231)	5651	TEST041A	4638	7412	BUT(IR15-12), IR=(120777); IR<15:12>="1010"				
					7042	K2/99	../..	../..	FI; K2=E1

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
232)	5652	TEST105B	5642	7425	SR LOAD/READ, SR=(000152); ALU-A/D/DBUF/IR PATH				
					7420	K4/70	K3/30	../..	FI; K4=E31-E32,E35,E37,E40-E41,E44,E52-E53,E57,E61, E75-E76; K3=E43,E51,E74,E76-E77,E82,E102
					7432	K4/99	../..	../..	FI; K4=E55
233)	5653	TEST040B	4602	7517	BUT(INSTR1), IR=(050777), CLASS-B(DOP*-MOV*SMO*-DMO)				
					7417	K3/99	../..	../..	FI; K3=E80
234)	5655	TEST040A	4574	7405	BUT(IR15-12), IR=(050777); IR<15:12>="0101"				
					7401	K3/99	../..	../..	FI; K3=E121
235)	5657	TEST037A	4531	7446	BUT(INSTR1), IR=(060205), CLASS-A(DOP*SMO*DMO)				
					7417	K7/35	K3/35	K2/35	FI; K7=E17; K3=E115; K2=E73
					7447	K3/99	../..	../..	FI; K3=E94
236)	5661	TEST036A	4486	7455	BUT(INSTR1), IR=(150506), CLASS-A(DOP*SMO*DMO)				
					7457	K3/99	../..	../..	FI; K3=E94
237)	5663	TEST035A	4442	7443	BUT(INSTR1), IR=(030701), CLASS-A(DOP*SMO*DMO)				
					7417	K3/99	../..	../..	FI; K3=E60,E80,E88,E90,E95,E97,E105,E107,E110, E115-E117,E120
					7441	K3/45	K6/30	K5/30	FI; K3=E43,E94,E107; K6=E91-E92; K5=E67,E98
					7442	K3/99	../..	../..	FI; K3=E94,E105
					7460	K3/99	../..	../..	FI; K3=E90
					7540	K3/99	../..	../..	FI; K3=E120
238)	5665	TEST034A	4398	7511	BUT(INSTR1), IR=(005112), CLASS-B(SOP*-DMO)				
					7517	K3/99	../..	../..	FI; K3=E98
					7751	K3/99	../..	../..	FI; K3=E98
239)	5667	TEST033A	4354	7517	BUT(INSTR1), IR=(106274), CLASS-B(SOP*-DMO)				
					7417	K3/99	../..	../..	FI; K3=E80,E100,E108,E120
					7515	K2/99	../..	../..	FI; K2=E114
					7562	K3/99	../..	../..	FI; K3=E108
					7716	K3/99	../..	../..	FI; K3=E100
240)	5670	TEST047B	5019	7413	BUT(IR11#FLOAT), IR=(122566); FP-ROM(534)=(13)				
					74??	K3/99	../..	../..	K305=FP-INSTR-DECODE
241)	5671	TEST032B	4317	7612	BUT(INSTR1), IR=(110125), CLASS-C(MOV*SMO*-DMO)				
					7451	K3/99	../..	../..	FI; K3=E109
					7602	K3/99	../..	../..	FI; K3=E4,E6-E7,E11,E15,E43,E118
					7752	K3/99	../..	../..	FI; K3=E85,E94,E104

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
242)	5673	TEST032A	4288	7412	BUT(MOV/DR7#IR5-3), IR=(110125); IR<5:3>="010", MOV				
					7402	K3/80	K5/20	../..	FI; K3=E57,E97; K5=E68
243)	5674	TEST103D	5476	7405	CSP ADDRESS, LOC(07); EMIT/CSP/ALU-B/D/DBUF/IR WITH DATA=(152500)				
					7322	K3/99	../..	../..	FI; K3=E22
					7400	K4/99	../..	../..	FI; K4=E59,E109-E110
244)	5675	TEST031B	4253	7604	BUT(INSTR1), IR=(010242), CLASS-C(MOV#SMO#-DMO)				
					7404	K3/99	../..	../..	FI; K3=E99
					7417	K3/90	K5/15	../..	FI; K3=E87,E90,E113,E119; K5=E98
					7514	K3/55	K6/30	K5/15	FI; K3=E115-E117; K6=E91-E92; K5=E67
					7607	K3/99	../..	../..	FI; K3=E98
					7614	K3/99	../..	../..	FI; K3=E97,E118
					7640	K3/99	../..	../..	FI; K3=E90
					7700	K3/99	../..	../..	FI; K3=E99,E110
					7704	K3/99	../..	../..	FI; K3=E98,E120
245)	5677	TEST031A	4224	7402	BUT(DMO#SMO#BYTE), IR=(010242); -DMO, SMO, -BYTE				
					7005	K3/99	../..	../..	FI; K3=E56
					7400	K3/99	../..	../..	FI; K3=E47,E56,E60,E80,E90,E109,E119-E120
					7406	K3/99	../..	../..	FI; K3=E109
246)	5701	TEST030A	4117	7552	BUT(INSTR1), IR=(005204), CLASS-D(SOP#DMO)				
					7313	K3/99	../..	../..	FI; K3=E2
					7553	K3/99	../..	../..	FI; K3=E87
247)	5703	TEST027A	4074	7561	BUT(INSTR1), IR=(106102), CLASS-D(SOP#DMO)				
					????	K3/99	../..	../..	K304/5=INSTR1-DECODE
248)	5705	TEST026A	4029	7574	BUT(INSTR1), IR=(105403), CLASS-D(SOP#DMO)				
					7570	K3/99	../..	../..	FI; K3=E108
					7574	K2/99	../..	../..	FI; K2=E67
					7757	K6/99	../..	../..	FI; K6=E82
249)	5707	TEST025A	3986	7543	BUT(INSTR1), IR=(006303), CLASS-D(SOP#DMO)				
					7540	K3/99	../..	../..	FI; K3=E99
					7557	K3/99	../..	../..	FI; K3=E105
250)	5710	TEST014D	3436	7401	BUT(IR11#FLOAT), IR=(000125); FP-ROM(020)=(01)				
					7400	K3/99	../..	../..	FI; K3=E86
251)	5711	TEST024B	3949	7557	BUT(INSTR1), IR=(005706), CLASS-D(SOP#DMO)				
					5125	K3/99	../..	../..	FI; K3=E12
					7306	K3/99	../..	../..	FI; K3=E5
			[Continued]		7407	K3/99	../..	../..	FI; K3=E44

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	5711	TEST024B	[Continued]		BUT(INSTR1), IR=(005706), CLASS-D(SOP*DMO)				
					7417	K3/99	../..	../..	FI; K3=E80,E88,E108,E117
					7547	K3/99	../..	../..	FI; K3=E118
					7550	K3/99	../..	../..	FI; K3=E120
					7553	K3/99	../..	../..	FI; K3=E106
					7555	K3/99	../..	../..	FI; K3=E103,E107
					7556	K3/99	../..	../..	FI; K3=E103,E105
					7577	K3/99	../..	../..	FI; K3=E108
252)	5712	TEST030B	4147	7424	BUT(IR11#FLOAT), IR=(005204); FP-ROM(240)=(04)				
					7420	K3/99	../..	../..	FI; K3=E86
					7425	K4/60	K2/20	K3/20	FI; K4=E32,E41-E43,E59,E66,E71,E79,E82,E92,E102, E109-E110; K2=E96,E101,E104,E110,E119; K3=E12, E43,E52,E71,E82,E86,E102
					7426	K3/99	../..	../..	FI; K3=E86
253)	5713	TEST030C	4166	7403	BUTR(IR11), IR=(005204); IR11="1"				
					7401	K3/99	../..	../..	K307=MICROBRANCH
254)	5715	TEST024A	3920	7402	BUTR(DR6/7L), IR=(005706); DR6				
					7403	K3/99	../..	../..	FI; K3=E93
255)	5717	TEST023A	3877	7560	BUT(INSTR1), IR=(106004), CLASS-D(SOP*DMO)				
					5122	K3/99	../..	../..	FI; K3=E14,E23
					5401	K3/99	../..	../..	FI; K3=E1
					7401	K3/99	../..	../..	FI; K3=E19
					7417	K3/99	../..	../..	FI; K3=E47,E60,E74,E80,E88,E90,E99,E104,E108-E110, E116,E119-E120
					7460	K3/99	../..	../..	FI; K3=E100
					7510	K3/99	../..	../..	FI; K3=E109
					7520	K3/99	../..	../..	FI; K3=E100
					7540	K3/99	../..	../..	FI; K3=E85,E108,E110
					7557	K3/99	../..	../..	FI; K3=E97,E105-E108,E118
					7561	K3/85	K4/15	../..	FI; K3=E79,E87,E103,E105; K4=E9
					7570	K3/99	../..	../..	FI; K3=E76,E118
					7760	K3/99	../..	../..	FI; K3=E96,E104,E114,E119
256)	5721	TEST022A	3833	7757	BUT(INSTR1), IR=(003063), CLASS-F(BRANCH)				
					0000	K3/99	../..	../..	FI; K3=E6
					5200	K3/99	../..	../..	FI; K3=E11
					7417	K3/60	K7/40	../..	FI; K3=E96,E104; K7=E13,E101
					7517	K3/99	../..	../..	FI; K3=E25
257)	5722	TEST015C	3519	7655	BUT(INSTR1), IR=(000152), CLASS-E(JMP)				
					7651	K3/99	../..	../..	FI; K3=E103,E106
					7654	K3/99	../..	../..	FI; K3=E93,E105
					7657	K3/99	../..	../..	FI; K3=E69,E89,E103

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
258)	5723	TEST021B	3775	7757	BUT(INSTR1), IR=(002315), CLASS-F(BRANCH)				
					7417	K3/99	../..	../..	FI; K3=E89,E96,E104,E109
					7751	K3/99	../..	../..	FI; K3=E116
259)	5725	TEST021A	3746	7400	BUT(DMO#SMO#BYTE), IR=(002315); -DMO, -SMO, -BYTE				
					7401	K3/99	../..	../..	FI; K3=E54,E85,E87-E88,E116
					7402	K3/99	../..	../..	FI; K3=E56,E109-E110,E114,E119
					7403	K3/50	K6/25	K5/25	FI; K3=E112,E114; K6=E83; K5=E59
					7404	K3/99	../..	../..	FI; K3=E74,E90,E109,E119-E120
					7406	K7/99	../..	../..	FI; K7=E20
					7600	K2/99	../..	../..	FI; K2=E36
					7606	K2/99	../..	../..	FI; K2=E15
260)	5726	TEST050B	5108	7412	BUT(INSTR5), IR=(175200); E88(752)=(12)				
					7434	K7/99	../..	../..	FI; K7=E13,E29,E94,E101
					74??	K3/99	../..	../..	K305=INSTR5-DECODE
261)	5727	TEST020C	3711	7757	BUT(INSTR1), IR=(001257), CLASS-F(BRANCH)				
					7417	K3/99	../..	../..	FI; K3=E95-E96,E104,E114
					7740	K3/99	../..	../..	FI; K3=E99
					7755	K3/99	../..	../..	FI; K3=E117
262)	5730	TEST047C	5039	7406	BUT(MOV/DR7#IR5-3), IR=(122566); IR<5:3>="110", -MOV				
					740?	K3/99	../..	../..	K308=MICROBRANCH
263)	5731	TEST020B	3689	7405	BUT(MOV/DR7#IR5-3), IR=(001257); IR<5:3>="101", -MOV				
					7407	K3/99	../..	../..	FI; K3=E54
					7415	K3/99	../..	../..	FI; K3=E94,E120
264)	5733	TEST020A	3662	7412	BUT(IR9-6), IR=(001257); IR<9:6>="1010"				
					7232	K3/99	../..	../..	FI; K3=E58
					7402	K3/70	K6/30	../..	FI; K3=E76,E83,E85-E86,E88; K6=E82-E83
					7413	K6/99	../..	../..	FI; K6=E73
265)	5734	TEST030D	4189	7405	BUT(INSTR5), IR=(005204); E88(452)=(05)				
					7400	K3/99	../..	../..	FI; K3=E88
					7403	K3/99	../..	../..	FI; K3=E88
					7407	K3/99	../..	../..	FI; K3=E88
					7415	K3/99	../..	../..	FI; K3=E88
					7417	K3/99	../..	../..	FI; K3=E88
					7425	K3/99	../..	../..	FI; K3=E68
					7426	K3/99	../..	../..	FI; K3=E38,E78,E109
					7437	K3/99	../..	../..	FI; K3=E38
					74??	K3/99	../..	../..	K305=INSTR5-DECODE

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
266)	5735	TEST017B	3626	7757	BUT(INSTR1), IR=(000522), CLASS-F(BRANCH)				
					7417	K3/99	../..	../..	FI; K3=E109-E110
					7652	K3/99	../..	../..	FI; K3=E114
					7717	K3/99	../..	../..	FI; K3=E89
					7752	K3/99	../..	../..	FI; K3=E96
267)	5737	TEST017A	3598	7405	BUT(IR9-6), IR=(000522); IR(9:6)="0101"				
					7401	K3/90	K5/10	../..	FI; K3=E50,E79,E83-E86,E88,E114; K5=E98
					7405	K3/99	../..	../..	FI; K3=E23
					7415	K6/65	K5/35	../..	FI; K6=E82-E83; K5=E59
268)	5741	TEST016A	3555	7757	BUT(INSTR1), IR=(100000), CLASS-F(BRANCH)				
					7400	K3/99	../..	../..	FI; K3=E51
					7417	K3/75	K6/15	K5/10	FI; K3=E43,E95,E98,E110,E113; K6=E91-E92; K5=E98
					7512	K6/99	../..	../..	FI; K6=E74
					7557	K3/99	../..	../..	FI; K3=E99
					7657	K3/99	../..	../..	FI; K3=E58,E70,E100
					7717	K3/99	../..	../..	FI; K3=E100
					7760	K3/99	../..	../..	FI; K3=E100
					7770	K3/99	../..	../..	FI; K3=E95,E110,E115,E119
					7777	K3/99	../..	../..	FI; K3=E108
269)	5743	TEST015A	3473	7425	BUT(INSTR5), IR=(000152); E78(152)=(25)				
					5076	K3/99	../..	../..	FI; K3=E10
					5673	K3/99	../..	../..	FI; K3=E3
					7305	K3/99	../..	../..	FI; K3=E20
					7400	K3/99	../..	../..	FI; K3=E33,E106
					7420	K4/50	K3/35	K6/15	FI; K4=E12,E14; K3=E75,E103; K6=E65
					7424	K3/99	../..	../..	FI; K3=E67,E78,E88
					7434	K2/99	../..	../..	FI; K2=E103,E111,E114
					7435	K3/99	../..	../..	FI; K3=E76,E78
					74??	K3/99	../..	../..	K305=INSTR5-DECODE
					7655	K3/99	../..	../..	FI; K3=E36
270)	5745	TEST014A	3368	7432	BUT(INSTR5), IR=(000125); E78(125)=(32)				
					7400	K3/99	../..	../..	FI; K3=E88
					7420	K3/50	K6/25	K5/20	K2/5 FI; K3=E66-E67,E77-E78,E84-E88,E93,E101, E103,E112; K6=E65-E66,E73-E74,E83,E92; K5=E67, E70,E106; K2=E112
					7422	K3/99	../..	../..	FI; K3=E78,E88
					7430	K3/99	../..	../..	FI; K3=E78,E88
					7434	K2/55	K7/15	K6/15	K3/15 FI; K2=E33,E71,E102,E108; K7=E17; K6=E91; K3=E43
					7436	K3/99	../..	../..	FI; K3=E75,E78
			[Continued]		74??	K3/99	../..	../..	K305=INSTR5-DECODE

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	5745	TEST014A	[Continued]		BUT(INSTR5), IR=(000125); E78(125)=(32)				
					7672	K3/99	../..	../..	FI; K3=E98
271)	5746	SFDFTOSR	10415	7777	(NUA SEQUENCING LOGIC ERROR)				
					????	K1/99	../..	../..	INTERNAL DCS ERROR
272)	5747	TEST013G	3331	7417	BUT(INSTR1), IR=(000000), CLASS-OTHER(NOT-A-THRU-G)				
					7400	K3/99	../..	../..	FI; K3=E97,E115
					7407	K3/99	../..	../..	FI; K3=E76,E97,E118
					7410	K3/99	../..	../..	FI; K3=E97-E98
					7413	K3/99	../..	../..	FI; K3=E75,E106
					7415	K3/99	../..	../..	FI; K3=E77,E107
					7416	K3/99	../..	../..	FI; K3=E67,E105
					7437	K3/99	../..	../..	FI; K3=E68,E108
					7440	K3/99	../..	../..	FI; K3=E90,E95,E99,E113,E115-E117,E121
					7457	K3/99	../..	../..	FI; K3=E70,E97,E100
					7460	K3/99	../..	../..	FI; K3=E47,E57,E90,E94,E97,E108,E110
					7510	K3/99	../..	../..	FI; K3=E120
					7540	K3/99	../..	../..	FI; K3=E108
					7650	K3/99	../..	../..	FI; K3=E96,E98
					7710	K3/99	../..	../..	FI; K3=E110
					7757	K3/99	../..	../..	FI; K3=E59,E110
					7776	K2/99	../..	../..	FI; K2=E32
273)	5750	TEST013F	3312	7434	BUT(INSTR5), IR=(000000); E78(000)=(34)				
					7400	K3/95	K4/5	K2/5	FI; K3=E38,E59,E68,E88-E89,E96,E98-E99,E104-E107, E109-E110,E113-E114,E116-E119; K4=E4; K2=E25
					7402	K3/99	../..	../..	FI; K3=E104,E106,E113,E115-E117
					7414	K3/99	../..	../..	FI; K3=E89
					7420	K3/99	../..	../..	FI; K3=E78
					7421	K2/55	K3/25	K5/20	FI; K2=E91,E111; K3=E78,E93; K5=E94
					7422	K2/50	K3/30	K5/20	FI; K2=E91,E111; K3=E78,E93; K5=E94
					7424	K3/55	K2/35	K5/15	FI; K3=E76,E78,E88,E93; K2=E91,E103; K5=E94
					7426	K3/99	../..	../..	FI; K3=E78
					7427	K2/99	../..	../..	FI; K2=E71
					7430	K3/99	../..	../..	FI; K3=E75,E78,E88
					7435	K3/99	../..	../..	FI; K3=E67,E78
					7436	K3/99	../..	../..	FI; K3=E77-E78
					7437	K3/99	../..	../..	FI; K3=E78
274)	5751	TEST013E	3291	7400	BUT(MOV/DR7#IR5-3), IR=(000000); IR<5:3>="000", -MOV				
					7401	K2/50	K3/30	K5/15 K6/5	FI; K2=E84,E91,E103; K3=E67,E93; K5=E94; K6=E65
					7402	K3/45	K2/35	K5/15 K6/5	FI; K3=E77,E103,E107,E109; K2=E91,E114; K5=E105; K6=E73
					7404	K2/45	K3/35	K5/20	FI; K2=E91,E114; K3=E75,E103; K5=E105
					7410	K3/99	../..	../..	FI; K3=E47,E57,E76,E113,E115-E117,E119-E120

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

```
                                                    ->Module sequence->
###)  ERROR code  Symbolic label      Line number  ENUA  TNUA  #1/%%  #2/%%  #3/%%  Test summary - Print reference - Chip information
---  ----------  ------------------  -----------  ----  ----  -----  -----  -----  ------------------------------------------------

275)  5752  TEST014B                    3394  7403  BUTR(DR6/7L), IR=(000125); DR5=-(DR6+7)
                                                 7402  K3/99  ../..  ../..  FI; K3=E37-E39,E64,E66,E79

276)  5753  TEST013D                    3272  7400  BUT(IR9-6), IR=(000000); IR<9:6>="0000"
                                                 7401  K3/99  ../..  ../..  FI; K3=E67
                                                 7402  K3/99  ../..  ../..  FI; K3=E77,E103
                                                 7404  K3/99  ../..  ../..  FI; K3=E75
                                                 7410  K3/99  ../..  ../..  FI; K3=E76

277)  5754  TEST621H                   15572  7402  CHECK "WR-CSP" LATCH CLEARED IN JAMMED U-WORD, WRITE NOT DONE
                                                 7401  K7/65  K3/35  ../..  FI; K7=E25,E41; K3=E32

278)  5755  TEST013C                    3253  7401  BUTR(IR11), IR=(000000); IR11="0"
                                                 7403  K3/99  ../..  ../..  FI; K3=E39,E56

279)  5756  TEST624D                   15864  7403  BUTR(PREFETCH*JAM) ASSERTED="1", GETS PREFETCH-H AT JAMUPP="1"
                                                 740?  K3/99  ../..  ../..  K306=PREFETCH*JAM-LOGIC
                                                 7747  K3/99  ../..  ../..  FI; K3=E17

280)  5757  TEST013B                    3233  7400  BUT(IR11#FLOAT), IR=(000000); IR<11>="0", FP-ROM(000)=(00)
                                                 7401  K2/45  K3/30  K5/15  K6/5   FI; K2=E97,E113; K3=E67,E86,E103; K5=E105;
                                                                                    K6=E66,E73
                                                 7402  K2/45  K3/35  K5/15  K6/5   FI; K2=E97-E98; K3=E77,E86,E114; K5=E97;
                                                                                    K6=E82
                                                 7404  K2/50  K3/35  K5/15  FI; K2=E97-E98; K3=E75,E86,E114; K5=E97
                                                 7410  K2/45  K3/40  K5/15  FI; K2=E97,E107; K3=E76,E86,E114; K5=E97
                                                 7417  K3/99  ../..  ../..  FI; K3=E86
                                                 7420  K2/50  K3/25  K5/15  K6/10  FI; K2=E97,E107; K3=E68,E114; K5=E97; K6=E82

291)  5761  TEST013A                    3205  7400  BUT(IR15-12), IR=(000000); IR<15:12>="0000"
                                                 7401  K2/55  K3/25  K5/20  FI; K2=E85,E102; K3=E67,E113; K5=E95
                                                 7402  K2/50  K3/30  K5/20  FI; K2=E85,E102; K3=E77,E113; K5=E95
                                                 7404  K2/45  K3/35  K5/20  FI; K2=E85,E108; K3=E75,E113; K5=E95
                                                 7405  K2/99  ../..  ../..  FI; K2=E102-E103,E108,E111,E114
                                                 7410  K2/45  K3/30  K5/15  K6/10  FI; K2=E85,E108; K3=E76,E113; K5=E95; K6=E91
                                                 7417  K2/60  K5/20  K7/10  K6/5   K4/5   FI; K2=E1,E17,E23,E34,E55-E56,E62,
                                                                                    E70-E71,E76,E82-E83,E85,E92,E100-E101,E105;
                                                                                    K5=E54,E84,E94-E95,E97,E105; K7=E28,E37,E54;
                                                                                    K6=E101; K4=E26,E29,E38,E87

282)  5762  TEST014C                    3414  7652  BUT(INSTR1), IR=(000125), CLASS-E(JMP)
                                                 7417  K3/99  ../..  ../..  FI; K3=E96,E98,E103,E107
                                                 7452  K3/99  ../..  ../..  FI; K3=E58,E70,E99
                                                 7612  K3/99  ../..  ../..  FI; K3=E100
                                       [Continued]  7640  K3/99  ../..  ../..  FI; K3=E90
```

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	5762	TEST014C	[Continued]		BUT(INSTR1), IR=(000125), CLASS-E(IMP)				
					7642	K3/99	../..	../..	FI; K3=E90,E98,E119
					7650	K3/99	../..	../..	FI; K3=E103,E107
					7653	K3/99	../..	../..	FI; K3=E58,E79,E93,E105,E109
					7656	K3/99	../..	../..	FI; K3=E69,E75,E89,E103,E106,E109
					7657	K3/99	../..	../..	FI; K3=E98,E105-E107
					7740	K3/99	../..	../..	FI; K3=E100
					7752	K3/99	../..	../..	FI; K3=E99,E120
283)	5763	TEST012G	3169	7474	BUT(INSTR1), IR=(177777), CLASS-A(FLOATING-POINT), FLAG<4:5>="00"				
					####	../..	../..	../..	!!! WATCH FOR BUSDIN PULLED LOW BY OTHER DRIVER !!!
					7434	K3/99	../..	../..	FI; K3=E37,E58,E70,E97-E98,E100
					7437	K3/99	../..	../..	FI; K3=E90,E97,E105-E107,E118
					7454	K3/99	../..	../..	FI; K3=E68,E108
					7464	K3/99	../..	../..	FI; K3=E76,E113,E118
					7470	K3/99	../..	../..	FI; K3=E75,E106
					7475	K4/45	K3/40	K2/15	K7/5 FI; K4=E3,E33-E34,E51,E55,E71,E82, E100-E101; K3=E3,E43,E51,E67,E82,E94,E102,E105; K2=E77,E95,E106; K7=E43
					7476	K4/50	K3/35	K2/15	K5/5 FI; K4=E3,E42-E43,E55,E59,E82,E109-E110; K3=E41,E43,E52,E77,E82,E94,E107; K2=E96,E100, E106; K5=E59
					7477	K3/65	K4/40	../..	FI; K3=E1,E41,E43,E51-E52,E61,E82,E102; K4=E3,E26, E29,E55,E70-E71
					7574	K3/99	../..	../..	FI; K3=E70,E97-E98,E100,E108,E116-E117,E120-E121
					7674	K3/99	../..	../..	FI; K3=E70,E90,E97-E100
					7774	K3/99	../..	../..	FI; K3=E95-E97,E99-E100,E104,E110,E119
284)	5764	TEST012F	3147	7402	BUTR(DR6/7L), IR=(177777); DR7				
					####	../..	../..	../..	!!! WATCH FOR BUSDIN PULLED LOW BY OTHER DRIVER !!!
					7403	K3/99	../..	../..	FI; K3=E64,E66
285)	5765	TEST012E	3127	7417	BUT(MOV/DR7*IR5-3), IR=(177777); IR<5:3>="111", -MOV				
					####	../..	../..	../..	!!! WATCH FOR BUSDIN PULLED LOW BY OTHER DRIVER !!!
					7400	K2/99	../..	../..	FI; K2=E26,E91
					7406	K3/75	K5/25	../..	FI; K3=E93; K5=E94
					7407	K3/60	K5/20	K2/10	K4/10 K6/5 K7/5 FI; K3=E57,E66,E71,E76, E78-E79,E81,E84,E92-E93,E95,E99,E101,E105-E107, E110,E113,E115-E119; K5=E48-E49,E67-E68,E94,E106, E113-E115; K2=E91,E103,E111-E112; K4=E12-E15, E106; K6=E65-E66; K7=E73,E82
					7413	K3/35	K5/30	K2/15	K6/5 K4/5 K7/5 FI; K3=E75,E78,E86-E87,E101, E103; K5=E56,E61,E70,E92,E105-E106; K2=E91,E114; K6=E73-E74; K4=E106; K7=E88
					7415	K5/40	K3/30	K2/10	K7/5 K6/5 K4/5 FI; K5=E56,E61,E67,E105-E106, E112; K3=E77-E78,E86-E87,E101,E103; K2=E91,E114; K7=E88; K6=E73-E74; K4=E106
			[Continued]		7416	K5/35	K3/35	K2/15	K6/10 K4/5 K7/5 FI; K5=E49,E67-E68,E94,E106,

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	5765	TEST012E	[Continued]		BUT(MOV/DR7#IR5-3), IR=(177777); IR<5:3>="111", -MOV				
					7416	K5/35	K3/35	K2/15	E120; K3=E67,E78,E86,E93,E101; K2=E91,E103; K6=E65-E66; K4=E106; K7=E82
					7437	K3/99	../..	../..	FI; K3=E68
286)	5766	TEST621G	15550	7401	BUTR(PREFETCH*JAM) NEGATED; GETS PREFETCH-H AT JAMUPP="0"				
					7403	K3/99	../..	../..	FI; K3=E44
					740?	K3/99	../..	../..	K306=PREFETCH*JAM-LOGIC
					7763	K2/75	K3/25	../..	FI; K2=E10-E12,E37-E39,E64-E66; K3=E2,E4-E5
287)	5767	TEST012D	3108	7417	BUT(IR9-6), IR=(177777); IR<9:6>="1111"				
					####	../..	../..	../..	!!! WATCH FOR BUSDIN PULLED LOW BY OTHER DRIVER !!!
					7407	K3/99	../..	../..	FI; K3=E76
					7412	K3/99	../..	../..	FI; K3=E34,E54,E64,E67-E68,E74-E75,E98
					7414	K3/75	K5/25	../..	FI; K3=E103; K5=E105
					7415	K3/45	K5/25	K2/10	K4/10 K6/5 K7/5 FI; K3=E34,E44,E50,E56, E76-E79,E84-E86,E88,E103,E112; K5=E51,E61,E70, E105-E106,E121; K2=E97,E113; K4=E12,E14,E105; K6=E73-E74; K7=E64
					7416	K3/40	K5/30	K2/15	K7/5 K6/5 K4/5 FI; K3=E67,E78,E84-E86,E88, E96,E103,E112; K5=E51,E61,E70,E105-E106,E122; K2=E97,E113; K7=E64; K6=E73-E74; K4=E105
					7437	K3/99	../..	../..	FI; K3=E68
					7457	K3/99	../..	../..	FI; K3=E98
288)	5770	TEST046B	4950	7401	BUT(IR11#FLOAT), IR=(000200); FP-ROM(040)=(01)				
					74??	K3/99	../..	../..	K305=FP-INSTR-DECODE
289)	5771	TEST012C	3088	7403	BUTR(IR11), IR=(177777); IR11="1"				
					####	../..	../..	../..	!!! WATCH FOR BUSDIN PULLED LOW BY OTHER DRIVER !!!
					5403	K2/99	../..	../..	FI; K2=E34
					7401	K3/99	../..	../..	FI; K3=E23,E33-E34,E37-E39,E44,E56,E70,E76-E77
					7407	K3/99	../..	../..	FI; K3=E74
					7443	K3/99	../..	../..	FI; K3=E37,E98
					7475	K2/90	K3/15	../..	FI; K2=E34,E40,E59,E65,E68,E74,E80; K3=E39
					7477	K3/99	../..	../..	FI; K3=E39
					7767	K2/99	../..	../..	FI; K2=E40
290)	5772	TEST015B	3500	7403	BUTR(DR6/7L), IR=(000152); DR2=-(DR6+7)				
					7402	K3/99	../..	../..	FI; K3=E66,E79
291)	5773	TEST012B	3069	7437	BUT(IR11#FLOAT), IR=(177777); IR<11>="1", FP-ROM(776)=(17)				
					####	../..	../..	../..	!!! WATCH FOR BUSDIN PULLED LOW BY OTHER DRIVER !!!
					7400	K7/50	K6/15	K3/15	K2/15 FI; K7=E80; K6=E91; K3=E34; K2=E97
					7401	K3/75	K5/25	../..	FI; K3=E114; K5=E97
					7403	K3/99	../..	../..	FI; K3=E34
					7411	K7/99	../..	../..	FI; K7=E80
			[Continued]		7413	K3/99	../..	../..	FI; K3=E34

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
	5773	TEST012B	[Continued]		BUT(IR11#FLOAT), IR=(177777); IR<11>="1", FP-ROM(776)=(17)				
					7416	K6/99	../..	../..	FI; K6=E91
					7417	K3/65	K5/15	K2/10	K6/5 K7/5 K4/5 FI; K3=E34,E52,E54,E56,E64, E67-E68,E74-E75,E87-E88,E98-E99,E112,E114, E116-E117; K5=E20,E59-E60,E97-E98,E107; K2=E97, E107; K6=E82-E83; K7=E81; K4=E38,E105
					7427	K3/55	K5/20	K2/10	K7/5 K6/5 K4/5 FI; K3=E34,E44,E56,E76-E77, E83,E85-E88,E99,E112,E114,E116; K5=E20,E59-E60, E97-E98,E109; K2=E97,E107; K7=E81; K6=E82-E83; K4=E105
					7433	K3/99	../..	../..	FI; K3=E75,E86
					7434	K3/40	K5/30	K2/15	K7/5 K6/5 K4/5 FI; K3=E76,E83,E85-E86,E88, E112,E114,E117; K5=E21,E59-E60,E97-E98,E108; K2=E97-E98; K7=E56; K6=E82-E83; K4=E105
					7435	K3/99	../..	../..	FI; K3=E77,E86
					7436	K3/50	K5/25	K2/10	K7/5 K6/5 K4/5 FI; K3=E50,E67,E75,E79, E83-E86,E88-E89,E112,E114; K5=E21,E59-E60, E97-E99; K2=E97-E98; K7=E56; K6=E82-E83; K4=E105
292)	5774	TEST021C	3797	7411	BUT(IR11#FLOAT), IR=(002315); FP-ROM(462)=(11)				
					7401	K3/99	../..	../..	FI; K3=E86
					7416	K5/99	../..	../..	FI; K5=E59
					74??	K3/99	../..	../..	K305=FP-INSTR-DECODE
293)	5775	TEST012A	3031	7417	BUT(IR15-12), IR=(177777); IR<15:12>="1111"				
					####	../..	../..	../..	!!! WATCH FOR BUSDIN PULLED LOW BY OTHER DRIVER !!!
					3000	K7/99	../..	../..	FI; K7=E10,E94
					3020	K7/99	../..	../..	FI; K7=E27
					3220	K7/99	../..	../..	FI; K7=E10,E21,E27,E29,E42,E52
					4102	K6/99	../..	../..	FI; K6=E70,E74,E92,E105
					5760	K2/99	../..	../..	FI; K2=E61
					7005	K2/55	K5/25	K3/25	FI; K2=E5,E29,E34,E38-E39,E50,E61,E68,E71,E76, E83-E85; K5=E20-E21,E48-E49,E51,E60; K3=E34,E37, E39,E51,E103,E112
					7376	K2/99	../..	../..	FI; K2=E46
					7400	K2/40	K3/25	K7/15	K5/15 K6/10 K4/5 FI; K2=E1,E5,E11,E17,E23, E25-E26,E29,E32-E34,E38-E39,E44-E46,E50-E51, E53-E54,E56,E59,E61-E62,E65,E70-E71,E74,E76-E77, E80,E82-E86,E91,E97-E98,E102-E103,E105,E107-E108, E111,E113-E114; K3=E23,E31-E34,E36-E37,E43,E45, E48,E51-E52,E57,E65-E66,E73,E92-E93,E101,E103, E112-E114; K7=E10,E13,E17,E20-E21,E27,E29,E33, E41,E52,E94; K5=E6,E20-E21,E31,E48-E49,E51,E54, E56,E61,E77,E95; K6=E65-E66,E70,E73-E74,E79-E80, E82-E83,E86,E95-E96,E98-E99,E101,E105,E108; K4=E29-E30,E38
					7401	K3/99	../..	../..	FI; K3=E113
			[Continued]		7402	K2/99	../..	../..	FI; K2=E29,E34,E61

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	5775	TEST012A	[Continued]		BUT(IR15-12), IR=(177777); IR<15:12>="1111"				
					7403	K7/96	K2/5	../..	FI; K7=E28,E56,E64-E65,E73,E81-E82,E88; K2=E61
					7404	K6/50	K2/50	../..	FI; K6=E105; K2=E76
					7405	K2/55	K6/25	K3/15	K5/5 FI; K2=E34,E71,E83-E85,E98,E102-E103, E107-E108,E111,E113-E114; K6=E3,E5; K3=E34,E45; K5=E65
					7407	K3/50	K5/25	K2/10	K6/5 K7/5 K4/5 FI; K3=E21,E76,E83,E85, E87-E88,E108,E110,E113; K5=E31,E77,E91,E95,E98; K2=E85,E108; K6=E91-E92; K7=E80; K4=E95
					7412	K3/85	K5/10	K7/5	K2/5 FI; K3=E34,E54,E64,E67-E68,E74-E75; K5=E68, E92; K7=E33; K2=E61
					7413	K5/45	K3/30	K6/10	K2/10 K7/5 K4/5 FI; K5=E31,E59,E67,E70,E77, E84,E95,E98,E101; K3=E21,E75,E85,E113,E121; K6=E91-E92,E95,E105; K2=E85,E108; K7=E80; K4=E95
					7414	K5/99	../..	../..	FI; K5=E60-E61,E77
					7415	K3/40	K5/25	K2/15	K6/5 K4/5 K7/5 FI; K3=E21,E77,E85,E94,E104, E113; K5=E6,E67,E77,E90,E95,E98; K2=E85,E102; K6=E91-E92; K4=E95; K7=E65
					7416	K3/40	K5/30	K2/10	K6/5 K4/5 K7/5 FI; K3=E21,E67,E85,E94,E104, E113; K5=E6,E67,E77,E95,E98,E100; K2=E85,E102; K6=E91-E92; K4=E95; K7=E65
					7437	K3/99	../..	../..	FI; K3=E34,E38,E68
					7447	K3/99	../..	../..	FI; K3=E70,E98
294)	5776	TEST624C	15839	7402	PROC-MUX(CUA-PORT)=(062551); CUA LOCKED, EXFLAG CLEAR, PREFETCH*JAM SET				
					7216	K3/99	../..	../..	FI; K3=E48
					7400	K3/75	K2/25	../..	FI; K3=E44,E48; K2=E111
295)	5777	TEST011	2847	6532	BUTA(SUBR-B) -> BUTA(RETURN) SEQUENCE, RETURN="1101 0101 1010"=(6532)				
					0777	K2/99	../..	../..	FI; K2=E55
					4644	K2/99	../..	../..	FI; K2=E46
					4747	K2/70	K4/20	K3/5	FI; K2=E5,E11,E23,E34,E46,E55; K4=E3; K3=E23
					5245	K6/99	../..	../..	FI; K6=E80
					6132	K2/99	../..	../..	FI; K2=E19,E41,E77-E78
					6432	K2/99	../..	../..	FI; K2=E7,E13,E25
					6512	K2/99	../..	../..	FI; K2=E7,E13,E25
					6532	K2/65	K4/35	../..	FI; K2=E26,E97; K4=E15
					6533	K2/99	../..	../..	FI; K2=E8,E14,E26
					6536	K2/99	../..	../..	FI; K2=E8,E14,E26
					7005	K3/55	K2/45	../..	FI; K3=E4,E6-E7,E11,E15,E43; K2=E70,E85
					7271	K3/60	K2/40	../..	FI; K3=E4,E6-E7,E11,E15,E43; K2=E61,E77,E85
					7274	K2/70	K3/30	../..	FI; K2=E1,E3,E6-E7,E12,E15,E18,E24,E30,E36; K3=E23, E58,E70
					7275	K2/99	../..	../..	FI; K2=E8,E25
					7301	K6/99	../..	../..	FI; K6=E104
					7417	K3/99	../..	../..	FI; K3=E23
					7532	K2/99	../..	../..	FI; K2=E35,E41,E77
					7577	K2/99	../..	../..	FI; K2=E42

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
296)	6252	TEST002	2654	6631	NUA SEQUENCING, NO 'BUT'				
					2631	K2/99	../..	../..	FI; K2=E55
					6231	K3/55	K2/45	../..	FI; K3=E63,E111; K2=E1,E19
					6777	K3/50	K2/50	../..	FI; K3=E11; K2=E32
297)	6520	TEST720B	16788	7402	DATIB*-BYTE, ODD ADDR JAM; JAM=(101004)				
					7400	K6/99	../..	../..	FI; K6=E52
298)	6521	TEST713D	16689	7402	DATI-NOINT, I/O PAGE, 16. BIT I/O PAGE MODE; SERVICE=(101740)				
					7400	K6/99	../..	../..	FI; K6=E51
					7401	K2/99	../..	../..	FI; K2=E8,E14,E26
299)	6522	TEST713C	16664	7403	BUTR(OTHER-JAM*FP), ILLEGAL INTERNAL ADR; OTHER-JAM="1"				
					7401	K7/99	../..	../..	FI; K7=E74
300)	6523	TEST712D	16555	7402	DATI, I/O PAGE, 16. BIT I/O PAGE MODE; SERVICE=(101740)				
					7400	K7/99	../..	../..	FI; K7=E82
					7403	K7/65	K6/35	../..	FI; K7=E80; K6=E89
301)	6524	TEST712C	16530	7401	BUTR(OTHER-JAM*FP), VALID INTERNAL ADDR; OTHER-JAM="0"				
					7403	K2/85	K5/15	../..	FI; K2=E26,E88,E104,E110,E116; K5=E105
302)	6526	TEST711D	16427	7402	CLEAR JAM ERRORS/SSYN TIMEOUT; JAM=(001000)				
					7400	K6/90	K7/10	../..	FI; K6=E3,E51,E80-E81,E99; K7=E58
303)	6530	TEST711C	16404	7402	DATOB*BYTE, I/O PAGE, 16. BIT I/O PAGE MODE; SERVICE=(005740)				
					7400	K2/70	K4/20	K7/5 K6/5	FI; K2=E1,E8,E14,E26,E31,E37,E43,E49,E52, E71,E82,E91,E105; K4=E13,E15; K7=E81,E97; K6=E34
					7401	K2/99	../..	../..	FI; K2=E26
304)	6534	TEST711B	16374	7402	DATOB*BYTE, SSYN TIMEOUT; JAM=(021200)				
					7400	K6/65	K7/30	K5/5	FI; K6=E50-E52,E81,E99; K7=E58,E64-E65,E84; K5=E84
					7401	K6/50	K7/25	K5/20 K3/10	FI; K6=E47,E55,E76,E85; K7=E81,E84; K5=E64, E67,E93; K3=E34
305)	6535	TEST512E2	13261	7412	KT-BSPHI[SF]=(06), NEGATED				
					7400	K3/99	../..	../..	FI; K3=E47
					74??	K3/99	../..	../..	K3|2=KT-SP-ADDR-DECODE
306)	6537	TEST512D1	13185	7400	KT-ASPHI[SF]=(16), ASSERTED, -F2*SR6*PS15				
					7412	K3/99	../..	../..	FI; K3=E47
					74??	K3/99	../..	../..	K3|2=KT-SP-ADDR-DECODE
307)	6541	TEST373A	9738	4777	BUTA(DIAGNOSE) CAUSES XFER TO B.M. ROM/JAMUPP TO DCS RETURN				
			[Continued]		0000	K2/99	../..	../..	FI; K2=E24,E30,E39,E45,E48,E51,E54,E60,E66,E68-E69,

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	6541	TEST373A	[Continued]		BUTA(DIAGNOSE) CAUSES XFER TO B.M. ROM/JAMUPP TO DCS RETURN				
					0000	K2/99	../..	../..	E78,E81
					0003	K3/99	../..	../..	FI; K3=E23
					0020	K2/99	../..	../..	FI; K2=E21
					0055	K2/99	../..	../..	FI; K2=E15
					0212	K2/99	../..	../..	FI; K2=E4,E10,E16,E22,E27-E28,E31,E36-E37,E42-E43, E49,E52,E58,E64,E67,E73,E79
					0777	K2/99	../..	../..	FI; K2=E24
					1020	K2/99	../..	../..	FI; K2=E50
					1025	K6/99	../..	../..	FI; K6=E42
					2000	K2/99	../..	../..	FI; K2=E48,E51,E57,E63
					2042	K2/99	../..	../..	FI; K2=E21,E74
					2153	K2/99	../..	../..	FI; K2=E75
					2211	K2/99	../..	../..	FI; K2=E75
					2247	K3/99	../..	../..	FI; K3=E22
					2310	K2/99	../..	../..	FI; K2=E75
					2314	K2/99	../..	../..	FI; K2=E75
					2405	K2/99	../..	../..	FI; K2=E75
					2442	K2/99	../..	../..	FI; K2=E21
					2526	K2/99	../..	../..	FI; K2=E24
					2530	K2/99	../..	../..	FI; K2=E24
					2577	K2/99	../..	../..	FI; K2=E48
					2671	K2/99	../..	../..	FI; K2=E57
					3007	K2/99	../..	../..	FI; K2=E57,E78
					3055	K2/99	../..	../..	FI; K2=E5,E11,E15,E17,E23,E29,E32,E38,E44,E50,E53, E59,E65,E68,E74,E80
					3353	K2/99	../..	../..	FI; K2=E75
					3462	K2/99	../..	../..	FI; K2=E42,E74
					3505	K2/99	../..	../..	FI; K2=E15,E21,E74
					3507	K2/99	../..	../..	FI; K2=E21
					3522	K2/99	../..	../..	FI; K2=E5,E11,E15,E17,E21,E27,E29,E32,E44,E50,E53, E68,E73-E74,E80
					3637	K2/99	../..	../..	FI; K2=E45,E68
					3777	K2/99	../..	../..	FI; K2=E42
					4621	K2/99	../..	../..	FI; K2=E48
					4747	K3/85	K2/15	../..	FI; K3=E8-E9; K2=E18
					5501	K2/99	../..	../..	FI; K2=E48,E57,E63,E78
					5555	K2/99	../..	../..	FI; K2=E48,E57,E63,E78
					5557	K2/99	../..	../..	FI; K2=E78
					6073	K2/99	../..	../..	FI; K2=E73
					7005	K2/99	../..	../..	FI; K2=E6,E12,E18,E24,E33,E45,E75
					7037	K4/50	K2/50	../..	FI; K4=E66; K2=E88
					7274	K2/99	../..	../..	FI; K2=E35,E47,E55
					7373	K2/99	../..	../..	FI; K2=E36,E73
					7637	K6/60	K7/40	../..	FI; K6=E39-E40,E42-E43,E56; K7=E36,E52
					7777	K2/99	../..	../..	FI; K2=E47

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
308)	6542	TEST512A1	13026	7405	KT-ASPHI[SF]=(02), NEGATED, -SR6				
					7412	K3/99	../..	../..	FI; K3=E45,E47
					74??	K3/99	../..	../..	K312=KT-SP-ADDR-DECODE
309)	6544	TEST512A2	13053	7400	KT-BSPHI[DF]=(16), ASSERTED, DR6*PS15*FLOAT				
					7412	K3/85	K4/15	../..	FI; K3=E45,E47,E58,E69,E79; K4=E13,E15
					74??	K3/99	../..	../..	K312=KT-SP-ADDR-DECODE
310)	6546	TEST512B2	13108	7400	KT-BSPHI[SF]=(16), ASSERTED, F2*SR6*SM0*PS13*-FLOAT				
					7412	K3/65	K4/35	../..	FI; K3=E45,E47,E89; K4=E13,E15
					74??	K3/99	../..	../..	K312=KT-SP-ADDR-DECODE
311)	6552	MFSS05	12715	6545	BUTR(MF-SAME-STACK)=H, EXPECTED L				
					6547	K3/80	K2/20	../..	FI; K3=E56,E79,E89,E96; K2=E106,E118
312)	6553	MFSS06	12725	6547	BUTR(MF-SAME-STACK)=L, EXPECTED H				
					6545	K3/75	K2/20	K5/5	FI; K3=E13,E47,E56,E63,E69,E79,E89,E96; K2=E62,E84, E106,E118; K5=E63
313)	6556	TEST512C1	13130	7400	KT-ASPHI[DF]=(16), ASSERTED, F1*DR6*DM0*PS13*-FLOAT				
					7412	K2/99	../..	../..	FI; K2=E119
					74??	K3/99	../..	../..	K312=KT-SP-ADDR-DECODE
314)	6557	TEST507D	12243	7407	BUTM(MASK-PS[T]), MASK-PS[T]=1*1="1"				
					7406	K2/99	../..	../..	FI; K2=E78,E101,E105,E112
315)	6561	TEST500	10968	6131	(NUA SEQUENCING LOGIC ERROR)				
					????	K1/99	../..	../..	INTERNAL DCS ERROR
316)	6563	TEST374	9898	NONE	(NUA SEQUENCING LOGIC/DCS ERROR)				
					????	K1/99	../..	../..	INTERNAL DCS ERROR
317)	6565	TEST512B1	13081	7412	KT-ASPHI[DF]=(06), NEGATED				
					7400	K3/99	../..	../..	FI; K3=E45,E47
					74??	K3/99	../..	../..	K312=KT-SP-ADDR-DECODE
318)	6566	TEST512C2	13157	7412	KT-BSPHI[SF]=(06), NEGATED				
					7400	K3/99	../..	../..	FI; K3=E47
					7406	K4/99	../..	../..	FI; K4=E59
					74??	K3/99	../..	../..	K312=KT-SP-ADDR-DECODE
319)	6567	ERROR624A	15803	0005	MICROBREAK JAMUPP AT (6255) ATTEMPTED; DID NOT OCCUR				
					6567	K3/99	../..	../..	FI; K3=E81,E91,E101,E111-E112

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
320)	6571	TEST372A	9606	6222	BUTA(SUBR-A)/BUTA(RETURN)				SEQUENCE; D<14:03> -> RETURN; "1100 1001 0010"=(6222
					4022	K2/99	../..	../..	FI; K2=E92
					4222	K2/99	../..	../..	FI; K2=E48,E77,E89,E92-E93,E95,E102,E106,E118
					6000	K2/99	../..	../..	FI; K2=E90
					6022	K2/99	../..	../..	FI; K2=E3,E6,E12,E18,E24-E25,E30,E33,E39,E45,E51, E54,E60,E66,E69,E75,E81,E89,E92-E93,E96,E101,E107
					6076	K2/99	../..	../..	FI; K2=E84,E90
					6200	K6/50	K2/50	../..	FI; K6=E34; K2=E86
					6202	K2/99	../..	../..	FI; K2=E3,E6,E12,E18,E24,E30,E33,E39,E45,E51,E54, E60,E66,E69,E75,E81,E86-E88,E104,E110,E113,E116
					6220	K2/99	../..	../..	FI; K2=E6,E9,E12,E18,E24,E26,E30,E33,E39,E45,E51, E54,E60,E66,E69,E75,E81,E86-E88,E104,E110,E114, E116
					6223	K2/99	../..	../..	FI; K2=E9,E26,E86,E103
					6226	K2/99	../..	../..	FI; K2=E9,E26,E86,E114
					6232	K2/99	../..	../..	FI; K2=E9,E26,E86,E113
					6262	K2/99	../..	../..	FI; K2=E3,E25,E86,E98
					6322	K2/99	../..	../..	FI; K2=E3,E25,E92,E98
					6362	K2/99	../..	../..	FI; K2=E98
					6376	K2/70	K7/15	K5/15	FI; K2=E61,E71,E83; K7=E36,E51; K5=E15
					6622	K2/99	../..	../..	FI; K2=E42,E77,E92,E107
					7222	K2/99	../..	../..	FI; K2=E72,E77,E92,E102
					7700	K2/99	../..	../..	FI; K2=E86
321)	6572	TEST373B	9814	7425	EXEC B.M. ROM CODE FOR "FLPADR" ASSERT TO ASPHI/READ				
					7400	K4/55	K2/35	K3/10	FI; K4=E1,E16,E20,E51,E54,E59-E60,E67,E69,E84,E93, E104,E114; K2=E4,E7,E10,E16,E18,E22,E25,E27-E28, E37,E43,E49,E52,E58,E64,E73; K3=E3,E7
					7402	K3/55	K2/25	K4/15	FI; K3=E1-E20,E22-E26,E45,E51,E66; K2=E4,E10,E16, E22,E27-E28,E31,E36-E37,E43,E49,E52,E58,E64,E67, E69,E73,E79; K4=E13,E15,E51,E54,E62,E69,E113-E114
					7403	K3/95	K4/5	../..	FI; K3=E1-E19,E22,E24-E26; K4=E29
					7417	K4/80	K2/20	../..	FI; K4=E59-E60,E84,E93; K2=E31,E69
					7420	K4/99	../..	../..	FI; K4=E1,E61,E66,E68,E70,E74-E77,E83,E85,E93-E94, E103-E104,E113-E114
					7426	K2/99	../..	../..	FI; K2=E43
					7432	K2/99	../..	../..	FI; K2=E4,E16,E22,E27-E28,E37,E43,E52,E58,E67,E79
					7433	K4/99	../..	../..	FI; K4=E54,E60,E66-E68,E70,E75-E76,E83,E103
					7434	K7/30	K6/30	K2/30	K3/15 FI; K7=E41,E66; K6=E78,E90; K2=E18,E75; K3=E7
322)	6573	TEST361A	8827	7434	SR=(052525), D[C]="1"; SR/XMUX=(100125) (FLTPT)				
					7400	K4/96	K3/5	../..	FI; K4=E27,E29,E37,E44,E46,E54,E69,E78; K3=E92
					7402	K4/99	../..	../..	FI; K4=E46
			[Continued]		7417	K4/99	../..	../..	FI; K4=E27

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	6573	TEST361A	[Continued]		SR=(052525), D[C]="1"; SR/XMUX=(100125) (FLTPT)				
					7420	K4/99	../..	../..	FI; K4=E37,E44
					7425	K4/99	../..	../..	FI; K4=E18
					7426	K4/99	../..	../..	FI; K4=E37
323)	6574	TEST710D	16265	7402	DATO, I/O PAGE, 16. BIT I/O PAGE MODE; SERVICE=(003740)				
					7400	K7/50	K6/30	K5/20	FI; K7=E44,E68,E71; K6=E51,E53-E54,E59,E105; K5=E7, E27,E30,E95
324)	6575	TEST710E	16294	7402	CLEAR JAM ERRORS/ODD ADDR; JAM=(001000)				
					7401	K7/99	../..	../..	FI; K7=E25,E59
325)	6576	TEST512D2	13212	7405	KT-BSPHI[DF]=(02), NEGATED, -DR6				
					7412	K3/99	../..	../..	FI; K3=E47,E79,E93
					74??	K3/99	../..	../..	K312=KT-SP-ADDR-DECODE
326)	6577	TEST512E1	13234	7400	KT-ASPHI[DF]=(16), ASSERTED, F1*DR6*-DM0*PS15				
					7405	K3/99	../..	../..	FI; K3=E45
					7412	K3/99	../..	../..	FI; K3=E47
					74??	K3/99	../..	../..	K312=KT-SP-ADDR-DECODE
327)	6600	TEST510D	12438	7406	BUTM(MASK-PS[T]), MASK-PS[T]=1*0="0"				
					7407	K2/99	../..	../..	FI; K2=E72,E101,E105
328)	6601	TEST503DA	11359	7406	BUTM(FLTPT-INSTR), IR=(125122), -FLTPT				
					7407	K2/99	../..	../..	FI; K2=E53,E112
329)	6603	TEST510A	12363	7407	BUTR(BG-SERVICE-L), NEGATED WHEN PS PRIO<7:5>=(7)				
					7403	K7/80	K3/15	K2/5	FI; K7=E3,E5,E28,E76; K3=E50,E74; K2=E100
330)	6604	TEST510E	12497	7403	BUTR(SERVICE-H), ASSERTED="1" WHEN FLAG<7>H="1"				
					7402	K2/99	../..	../..	FI; K2=E78,E100
331)	6605	TEST506E	12099	7403	BUTR(INTR-HIGH), INTR-HIGH-H="1"; INTERNAL SERVICE CLEAR				
					4747	K6/99	../..	../..	FI; K6=E78
					7401	K7/85	K3/10	K2/5	FI; K7=E37,E43,E48,E50,E57-E58,E66-E67,E76-E77, E84; K3=E44,E50; K2=E72,E100
332)	6607	TEST511A	12755	NONE	(NUA SEQUENCING LOGIC ERROR)				
					????	K1/99	../..	../..	INTERNAL DCS ERROR
333)	6610	TEST510F	12524	7402	BUTR(SERVICE-H), NEGATED="0", NO INPUTS ACTIVE				
					7403	K7/80	K2/15	K3/5	FI; K7=E3,E7-E8,E11,E16,E27; K2=E38,E78,E100; K3=E64
334)	6611	TEST507C	12221	7406	BUTM(PS03), PS<03>H="0"				
					7407	K2/99	../..	../..	FI; K2=E112
					740?	K2/80	K3/20	../..	K210=MULTIPLE-BUT; K306=PS[CC]

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
335)	6613	TEST507A	12144	7402	LOAD/READ PS=(140125) PS-PORT PROC-MUX; UCON FUNCTION				
					7400	K2/50	K3/45	K4/5	K7/5 FI; K2=E102-E103,E105,E111,E113-E114,E116, E118; K3=E35,E71-E73,E83; K4=E63,E72; K7=E3
					7401	K3/45	K2/45	K4/10	FI; K3=E28,E47,E54,E63; K2=E108,E118; K4=E72
336)	6615	TEST504A	11578	4777	NUA SEQUENCING ERROR, JAMUPP ERROR; BUTA(DIAGNOSE) TO B.M. 'LOADNZW4/LOADNZW5'				
					4744	K2/99	../..	../..	FI; K2=E54
					4757	K2/99	../..	../..	FI; K2=E54
337)	6616	TEST510C	12418	7403	BUTR(SERVICE-H), ASSERTED="1" WHEN INTR-HIGH-H="0"				
					7345	K3/99	../..	../..	FI; K3=E76
					7402	K2/75	K3/25	../..	FI; K2=E100; K3=E64
338)	6617	TEST510DA	12475	7407	BUTM(DOO), D=(040401)				
					7406	K2/99	../..	../..	K210=MULTIPLE-BUT
339)	6621	TEST506A	11952	7402	LOAD/READ PS=(030252) PS/PROC-MUX; BUTA(CLR-...) SETS BUSDIN=EMIT; UCON FCN				
					7400	K2/50	K3/40	K7/10	K5/5 FI; K2=E61-E62,E70-E71,E82-E83,E98, E102-E103,E107-E108,E111-E114,E116-E118; K3=E47, E52,E57,E62-E63,E72-E73,E83,E89; K7=E3,E27,E42, E44,E48; K5=E13,E54,E84
					7401	K2/90	K3/10	../..	FI; K2=E62,E82,E117; K3=E57
					7403	K2/99	../..	../..	FI; K2=E108
340)	6623	TEST505A	11847	7402	SET ALL FLAGS, CHECK BUTA(CLR-FLAG-RES-UCON) CLEARS SHORT TERM FLAGS				
					7400	K2/99	../..	../..	FI; K2=E101,E105,E119
341)	6625	TEST533A	13528	7402	SHIFTER, AMUX/D[HI]#D[LO]=(052652), D=(0)(052652)				
					7400	K4/99	../..	../..	FI; K4=E29,E51,E54,E60-E62,E66-E69,E77,E83-E85, E93-E94,E103-E104,E113-E114
342)	6627	TEST520A	13322	7403	INSTR-BRANCH-L="H", IR=(101004)=BHI, PS[NZVC]=(04)				
					7402	K3/99	../..	../..	FI; K3=E64,E83
					740?	K3/99	../..	../..	K2=PS[CC]-BRANCH(E64,72-73,83)
343)	6630	TEST503B	11318	7406	BUTM(FLAG7), FLAG(7)H="0"				
					7407	K2/85	K3/15	../..	FI; K2=E112; K3=E54
344)	6631	TEST003	2673	5525	NUA SEQUENCING, PAGE (6) -> (5), UBF=(35)				
					4525	K2/80	K4/10	K3/10	FI; K2=E35,E47,E58,E62,E64,E67,E72-E73,E78,E91; K4=E3; K3=E111
					5425	K3/50	K2/50	../..	FI; K3=E58,E91; K2=E1,E7
					5520	K2/99	../..	../..	FI; K2=E76
					5544	K2/99	../..	../..	FI; K2=E90
				[Continued]	5546	K2/99	../..	../..	FI; K2=E71

###	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
	6631	TEST003	[Continued]		NUA SEQUENCING, PAGE (6) -> (5), UBF=(35)				
					6525	K2/99	../..	../..	FI; K2=E46,E59,E65,E68,E74,E80
					7525	K2/99	../..	../..	FI; K2=E35,E47
345)	6632	TEST503C	11338	7402	BUTR(FLTPT-PROC-H), FLTPT-PROC-H="0"				
					4402	K2/99	../..	../..	FI; K2=E34
					7403	K3/50	K2/50	../..	FI; K3=E64; K2=E119
					7406	K2/60	K3/40	../..	FI; K2=E2,E8,E66,E69,E75,E81; K3=E21,E81
346)	6633	TEST533B	13569	7402	SHIFTER, AMUX/D[HI]#D[LO]=(125125), D=(0)(125125)				
					6367	K3/99	../..	../..	FI; K3=E38
					7400	K4/99	../..	../..	FI; K4=E51,E54,E59-E62,E66-E69,E74-E76,E83-E85, E93-E94,E103-E104,E113
					7401	K4/99	../..	../..	FI; K4=E75-E76
					7403	K4/99	../..	../..	FI; K4=E51,E54,E62,E69,E84,E103,E114
347)	6634	TEST534B	13650	7402	SHIFTER, AMUX/D[LO]#D[HI]=(052652), D=(0)(125125)				
					7400	K4/99	../..	../..	FI; K4=E93-E94,E103-E104,E113
					7403	K4/99	../..	../..	FI; K4=E114
348)	6635	TEST534D	13725	7402	SHIFTER, AMUX/8*D[C]#D[HI]=(000377), D=(0)(177777)				
					7400	K4/75	K2/20	K3/10	FI; K4=E59,E93,E104,E113-E114; K2=E65,E68; K3=E75
					7403	K4/99	../..	../..	FI; K4=E114
349)	6636	TEST534F	13805	7402	SHIFTER#COUNTER, AMUX/COUNT#D[HI]=(052652), CTR=(125), D=(0)(125000)				
					7400	K4/99	../..	../..	FI; K4=E87,E90-E91,E93,E104,E113
					7401	K4/99	../..	../..	FI; K4=E114
					7403	K4/99	../..	../..	FI; K4=E8,E91,E114
350)	6637	TEST535B	13926	7402	SHIFTER, BMUX/4*D[C]#AMUX=(002645), D=(0)(055132)				
					7400	K4/99	../..	../..	FI; K4=E69,E83-E85
					7403	K4/99	../..	../..	FI; K4=E69
351)	6640	TEST536B	14019	7402	SHIFTER, CMUX/2*D[C]#BMUX=(034343), D=(0)(161616)				
					7400	K4/99	../..	../..	FI; K4=E54,E60-E61,E67,E75
					7401	K5/99	../..	../..	FI; K5=E105
					7403	K4/99	../..	../..	FI; K4=E54
352)	6641	TEST536D	14103	7402	SHIFTER, CMUX/D[C]#BMUX=(063146), D=(0)(146314)				
					7400	K4/90	K3/15	../..	FI; K4=E60-E62,E67-E68,E75-E76; K3=E42
					7403	K4/99	../..	../..	FI; K4=E54
353)	6642	TEST536F	14196	7402	SHIFTER, CMUX/BMUX#SENDMUX=(063146), D/SR=(0)(031463)(077777)				
					7400	K4/99	../..	../..	FI; K4=E60-E62,E67-E68,E75-E77
					7403	K4/99	../..	../..	FI; K4=E54
354)	6643	NEWCTR537A	14291	7370	(NUA SEQUENCING LOGIC ERROR)				
					????	K1/99	../..	../..	INTERNAL DCS ERROR

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
355)	6644	TEST71CB	16212	7402	DATO, ODD ADDR ERR; JAM=(101004)				
					7400	K7/45	K5/45	K6/10	FI; K7=E61,E65-E66,E80,E82,E84; K5=E13,E43-E45, E64; K6=E76
					7401	K6/80	K7/20	../..	FI; K6=E71,E80-E81,E99; K7=E80,E82
356)	6645	TEST710C	16236	7402	DATO, I/O PAGE, 18. BIT I/O PAGE MODE; SERVICE=(002340)				
					7400	K7/65	K5/15	K6/15 K4/5 K3/5	FI; K7=E14,E27,E32,E44,E64-E65,E68, E70,E73,E76-E77,E79-E82,E84,E88; K5=E13-E14,E39, E67,E93; K6=E43,E46-E47,E53-E54,E59,E81; K4=E20, E65; K3=E34
					7401	K2/65	K7/15	K6/15	FI; K2=E1,E82; K7=E80; K6=E43
					7403	K7/99	../..	../..	FI; K7=E80
357)	6646	TEST503K	11531	7407	BUTM(FLTPT-INSTR), IR=(175252), FLTPT				
					7406	K2/50	K3/50	../..	K210=MULTIPLE-BUT; K304=FP-DECODE
358)	6647	TEST507F	12286	7407	CHECK PS[C]=PS<00>="1", D[C] INPUTS PS[C], CIN/PS[C], CIN/D[C]=PS[C] ALL SET				
					7400	K3/50	K2/50	../..	FI; K3=E93; K2=E112
					7401	K4/99	../..	../..	FI; K4=E86
					7406	K3/99	../..	../..	FI; K3=E35,E46
359)	6653	TEST536E	14154	7402	SHIFTER, CMUX/BMUX#SENDMUX=(114631), D/SR=(0)(146314)(100000)				
					7400	K4/99	../..	../..	FI; K4=E54,E60-E62,E67-E68,E75-E77,E80
360)	6655	TEST536C	14067	7402	SHIFTER, CMUX/D[C]#BMUX=(114631), D=(1)(031463)				
					7400	K4/95	K6/5	../..	FI; K4=E54,E60-E62,E67-E68,E70,E75-E76; K6=E108
361)	6657	TEST536A	13973	7402	SHIFTER, CMUX/2#D[C]#BMUX=(143434), D=(1)(016161)				
					7400	K4/99	../..	../..	FI; K4=E60-E62,E68,E76,E84
					7401	K4/99	../..	../..	FI; K4=E54,E60-E62,E67-E68,E70,E75-E76
362)	6661	TEST535A	13879	7402	SHIFTER, BMUX/4#D[C]#AMUX=(175132), D=(1)(122645)				
					7400	K4/99	../..	../..	FI; K4=E3,E60,E69,E75,E77,E83-E85
363)	6663	TEST534E	13765	7402	SHIFTER#COUNTER, AMUX/COUNT#D[LO]=(125125), CTR=(252), D=(0)(000125)				
					7400	K4/96	K2/5	../..	FI; K4=E87,E90-E91,E93,E104,E113-E114; K2=E55
					7401	K4/80	K6/15	K2/5	FI; K4=E87,E90-E91; K6=E103; K2=E55
					7403	K4/99	../..	../..	FI; K4=E91,E114
364)	6665	TEST534C	13691	7402	SHIFTER, AMUX/8#D[C]#D[HI]=(177400), D=(1)(000000)				
					7400	K4/99	../..	../..	FI; K4=E67-E68
					7401	K4/99	../..	../..	FI; K4=E28-E29,E93,E104,E113-E114
365)	6667	TEST534A	13615	7402	SHIFTER, AMUX/D[LO]#D[HI]=(125125), D=(0)(052652)				
			[Continued]		6356	K2/65	K3/35	../..	FI; K2=E2,E8-E9,E21,E27,E60,E66,E69,E75,E81;

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	6667	TEST534A	[Continued]		SHIFTER, AMUX/D[LO]#D[HI]=(125125), D=(0)(052652)				
					6356	K2/65	K3/35	../..	K3=E21-E22,E44,E56,E77
					7341	K2/99	../..	../..	FI; K2=E34
					7343	K3/99	../..	../..	FI; K3=E37-E39,E44,E64
					7400	K4/90	K3/5	K2/5	FI; K4=E28-E29,E77,E93-E94,E103-E104,E113-E114; K3=E3; K2=E74
					7401	K4/99	../..	../..	FI; K4=E28-E29,E93,E104,E113-E114
366)	6670	TEST503D	11379	7476	BUT(INSTR1), IR=(175252), CLASS-A(FLTPT), FLAG<4:5>H="10"				
					7474	K2/85	K7/15	../..	FI; K2=E62,E100; K7=E44
					747?	K3/99	../..	../..	K305=FLAGS/FP-INSTR1
367)	6671	TESTD500	11008	6377	(NUA SEQUENCING LOGIC ERROR)				
					6173	K2/70	K3/30	../..	FI; K2=E2-E3,E6-E7,E12,E15,E18,E24,E30,E36; K3=E23, E58,E70
					7376	K3/99	../..	../..	FI; K3=E58
					????	K1/95	../..	../..	INTERNAL DCS ERROR
368)	6672	TEST504F	11742	7407	BUTM(EXFLAG2), EXFLAG<2>H="1"				
					7406	K2/99	../..	../..	K210=FLAGS
369)	6673	TEST500A	11070	7434	SP REWRITE FUNCTION WR(A,HI,A) DOESN'T WRITE B-SIDE				
					74??	K4/99	../..	../..	K405=SP-REWRITE-CNTL,K406/7=A/B-SPADS
370)	6674	TEST507E	12265	7401	BUTR(INTR-HIGH), INTR-HIGH-H="0"; INTERNAL SERVICE SET				
					7403	K2/65	K3/35	../..	FI; K2=E72; K3=E44
371)	6675	TEST510B	12396	7407	BUTR(BG+FP/SERVICE), NEGATED="0" WHEN PS PRIO<7:5>=(7)				
					7277	K2/99	../..	../..	FI; K2=E43
					7377	K2/65	K3/35	../..	FI; K2=E16-E18,E44-E45,E67-E69; K3=E3,E7-E8,E25
					7417	K3/99	../..	../..	FI; K3=E50,E76
372)	6677	TEST503A	11238	4332	NUA SEQUENCING ERROR; BUTA(DIAGNOSE) TO B.M. 'LOADNZW4', 'LOADNZW5'				
					0000	K2/99	../..	../..	FI; K2=E11,E17,E23,E29,E32,E38,E44,E50,E53-E54,E57, E59,E63,E65,E68,E72,E74,E78,E80,E92-E93
					0127	K2/75	K3/25	../..	FI; K2=E35,E47,E72,E78; K3=E111
					0332	K2/99	../..	../..	FI; K2=E63,E80
					0732	K2/99	../..	../..	FI; K2=E5,E11,E15,E17,E23,E29,E32,E38,E44,E50,E53, E59,E65,E68,E74,E8C
					4032	K2/99	../..	../..	FI; K2=E30
					4126	K2/99	../..	../..	FI; K2=E6,E12,E18,E24,E30,E33,E39,E45,E51,E54,E60, E66,E69,E75,E81
					4322	K2/99	../..	../..	FI; K2=E81
					4330	K2/99	../..	../..	FI; K2=E81
					4331	K2/99	../..	../..	FI; K2=E81
					4335	K2/99	../..	../..	FI; K2=E81
					4336	K2/99	../..	../..	FI; K2=E80
			[Continued]		4337	K2/99	../..	../..	FI; K2=E57,E78

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

M06

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
	6677	TEST503A	[Continued]		NUA SEQUENCING ERROR; BUTA(DIAGNOSE) TO B.M. 'LOADNZW4', 'LOADNZW5'				
					4352	K2/99	../..	../..	FI; K2=E30
					4372	K2/99	../..	../..	FI; K2=E30
					4375	K2/99	../..	../..	FI; K2=E92
					4732	K2/99	../..	../..	FI; K2=E5,E11,E17,E21,E23,E29,E32,E38,E44,E50,E53, E59,E65,E68,E74,E80
					4747	K3/99	../..	../..	FI; K3=E1-E20,E24-E26
					7005	K2/99	../..	../..	FI; K2=E5,E11,E15,E17,E29,E32,E50,E53-E54,E63,E65, E68,E74,E80
373)	6700	TEST503E	11407	7402	EXFLAGS<2:1>H="01", READ THRU CUA-PORT, PROC-MUX				
					7400	K2/85	K3/15	../..	FI; K2=E92,E101,E103,E106,E108,E111-E112,E119; K3=E48
					7403	K2/99	../..	../..	FI; K2=E108
374)	6701	TEST372B	9658	5555	BUTA(SUBR-A)/BUTA(RETURN) SEQUENCE; D<14:03> -> RETURN; "1011 0110 1101"=(5555				
					4555	K2/99	../..	../..	FI; K2=E77,E89,E92,E95,E102,E106
					5155	K2/99	../..	../..	FI; K2=E6,E12,E18,E24,E30,E33,E39,E42,E45,E51,E54, E60,E66,E69,E75,E77,E81,E89,E92-E93,E96,E106-E107
					5355	K2/99	../..	../..	FI; K2=E92,E107
					5455	K2/99	../..	../..	FI; K2=E3,E6,E12,E18,E24-E25,E30,E33,E39,E45,E51, E54,E60,E66,E69,E75,E81,E89,E92-E93,E96,E98,E101
					5515	K2/99	../..	../..	FI; K2=E3,E6,E12,E18,E24-E25,E30,E33,E39,E45,E51, E54,E60,E66,E69,E75,E81,E86-E87,E89,E96,E98,E101
					5557	K2/99	../..	../..	FI; K2=E9,E26,E86,E114
					7555	K2/99	../..	../..	FI; K2=E72,E77,E92,E102
375)	6702	TEST504G	11762	7406	BUTM(EXFLAG1), EXFLAG<1>H="0"				
					7407	K2/99	../..	../..	FI; K2=E112
376)	6704	TEST410B	10814	7434	IR PATTERN LOOP: D<14:00>=ZERO NEGATED CORRECT # TIMES				
					7400	K4/65	K3/35	../..	FI; K4=E24,E33; K3=E84
377)	6705	TEST410E	10911	7402	IR PATTERN LOOP: "BYTE-CONSTANT/SECOND-1-OR-2" ASSERTED CORRECT # TIMES				
					7400	K4/99	../..	../..	FI; K4=E33
					7401	K3/99	../..	../..	FI; K3=E49,E60
378)	6706	TEST504H	11783	7406	BUTR(FPS05), FPS<05>="0"				
					7407	K3/99	../..	../..	FI; K3=E54
379)	6707	TEST410C	10844	7402	IR PATTERN LOOP: "BYTE-H" ASSERTED/NEGATED CORRECT # TIMES				
					7400	K3/65	K5/35	../..	FI; K3=E85; K5=E63
					7401	K6/85	K7/15	../..	FI; K6=E60,E78-E80; K7=E10
380)	6710	TEST503F	11433	7406	BUTM(EXFLAG2), EXFLAG<2>H="0"				
					7407	K2/99	../..	../..	FI; K2=E112

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
381)	6711	TEST410A	10790	7422	IR PATTERN LOOP: D<14:00>=ZERO ONLY ASSERTED 2. TIMES				
					7420	K2/99	../..	../..	FI; K2=E40,E88-E89
					7421	K4/65	K3/35	../..	FI; K4=E99; K3=E66
					7424	K2/99	../..	../..	FI; K2=E77,E88-E89,E95,E99,E101,E106
					7436	K2/99	../..	../..	FI; K2=E88-E89,E106
382)	6712	TEST505B	11891	7407	EXFLAG<2> NOT CLEARED BY BUTA(CLR-FLAG-RES-UCON)				
					7406	K2/99	../..	../..	K207=ACTIVE-BUT,K210=FLAGS
383)	6713	TEST371B	9538	7401	SR/NOP HAS NO EFFECT ON GUARD="0100"				
					74??	K4/99	../..	../..	K408=SR/RES/GUARD-LOGIC
384)	6714	TEST503A	11292	7402	LOAD/READ FLAGS#FPS=(125252) FLAG-PORT PROC-MUX; UCON FUNCTION				
					4777	K3/99	../..	../..	FI; K3=E41,E52,E111
					7400	K3/60	K2/40	K7/5	K5/5 FI; K3=E1-E20,E22-E27,E29,E33,E35,E41,E47, E51,E54,E94; K2=E4,E10,E16,E22,E28,E31,E36-E37, E43,E49,E52,E58,E62,E64,E67,E73,E79,E82,E98-E99, E101-E103,E106-E108,E110-E111,E113-E114,E117, E119; K7=E42,E44; K5=E84
					7401	K2/55	K7/20	K5/15	K3/10 FI; K2=E62,E71,E82-E83,E100-E101,E106,E108, E117; K7=E42,E44,E51,E79; K5=E15,E59,E67,E70; K3=E57,E61
					7403	K2/65	K3/25	K4/10	FI; K2=E95,E106,E108,E118; K3=E41; K4=E33
385)	6715	TEST371A	9490	7434	SR/NOP HAS NO EFFECT ON SR=(052525)				
					7400	K4/99	../..	../..	FI; K4=E36,E80
					7433	K4/99	../..	../..	FI; K4=E35
386)	6716	TEST504I	11804	7403	BUTM(FLTPT-FD-H), FLTPT-FD-H="1"				
					7402	K3/50	K2/50	../..	FI; K3=E64,E86; K2=E119
387)	6717	TEST370D	9467	7401	SR/LEFT-GUARD/ENB SHIFTS GUARD LEFT, GD<3:0>="0100" AFTER				
					7400	K4/99	../..	../..	FI; K4=E53
388)	6720	TEST503G	11453	7407	BUTM(EXFLAG1), EXFLAG<1>H="1"				
					4756	K3/99	../..	../..	FI; K3=E61
					7406	K2/65	K4/15	K3/15	FI; K2=E112; K4=E86; K3=E54
389)	6721	TEST370C	9429	7434	SR/LEFT-GUARD/ENB, GD<3>="1"; SR=(052525) AFTER				
					74??	K4/99	../..	../..	K408=SR/RES/GUARD-LOGIC
390)	6722	TEST505C	11912	7406	EXFLAG<1> CLEARED BY BUTA(CLR-FLAG-RES-UCON)				
					7406	K2/99	../..	../..	K207=ACTIVE-BUT,K210=FLAGS

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
391)	6723	TEST370B	9405	7402	SR/LEFT-GUARD/ENB SHIFTS GUARD LEFT, GD<3:0>="1010" AFTER				
					7400	K4/99	../..	../..	FI; K4=E30
					7401	K2/99	../..	../..	FI; K2=E83
392)	6724	TEST507B	12201	7403	BUTR(PS15), PS<15>H="1"				
					7402	K5/99	../..	../..	FI; K5=E54
393)	6725	TEST370A	9360	7434	SR LEFT 1, SR=(125252) AFTER; GUARD/ENB="1010" AFTER				
					7400	K2/85	K4/10	K7/5	FI; K2=E46,E55,E61,E83,E105; K4=E80,E87; K7=E28
					7421	K4/99	../..	../..	FI; K4=E80,E86
394)	6726	TEST500C	11100	7402	IR PATTERN LOOP: 'OVERLAP-L' ASSERTED TO ASPLO CORRECT # TIMES				
					7400	K3/80	K4/10	K7/5	K2/5 FI; K3=E46,E59,E80,E84,E87,E89,E116-E117; K4=E25,E96,E99; K7=E69; K2=E55,E105
					7401	K3/99	../..	../..	FI; K3=E46,E57,E59,E80,E84,E87,E89,E121
395)	6727	TEST410D	10879	7402	IR PATTERN LOOP: "BYTE-CONSTANT/FIRST-1-OR-2" ASSERTED CORRECT # TIMES				
					7400	K3/90	K5/5	K4/5	FI; K3=E50,E59-E60,E79,E89,E116-E117; K5=E63,E66; K4=E15
					7401	K3/96	K4/5	../..	FI; K3=E32,E36,E46,E49-E50,E59-E60,E79,E89; K4=E38
396)	6730	TEST504B	11647	7407	BUTM(FLAG7), FLAG<7>H="1"				
					7406	K2/99	../..	../..	FI; K2=E106
397)	6731	TEST367A	9317	7401	SR/LOAD-GUARD/DISABLED SETUP BY BUTA(CLR-RES), GUARD NOT ALTERED				
					74??	K4/99	../..	../..	K408=SR/RES/GUARD-LOGIC
398)	6732	TEST503H	11474	7407	BUTR(FPS05), FPS<05>H="1"				
					7406	K2/99	../..	../..	FI; K2=E7,E13,E25,E110,E117
399)	6733	TEST366C	9278	7434	SR LEFT 1, D[C]="1"; SR=(025251) AFTER; (GUARD/DIS)				
					7400	K4/99	../..	../..	FI; K4=E36
					7402	K4/99	../..	../..	FI; K4=E45
					7420	K4/99	../..	../..	FI; K4=E35
					7421	K4/99	../..	../..	FI; K4=E52,E71,E86
400)	6734	TEST506D	12076	7406	BUTM(MASK-PS[T]), MASK-PS[T]=0*1="0"				
					7407	K2/99	../..	../..	FI; K2=E72,E78,E105,E112
401)	6735	TEST366B	9256	7401	CHECK GUARD NOT ALTERED ON SR/LEFT-GUARD/DISABLED SHIFT				
					7402	K4/99	../..	../..	FI; K4=E30,E80,E86
402)	6736	TEST500E	11164	7402	IR PATTERN LOOP: BUTR(PREFETCH[0]H) ASSERTED CORRECT # OF TIMES				
					7400	K3/99	../..	../..	FI; K3=E32,E34,E38,E44,E48,E80
					7401	K3/90	K2/10	../..	FI; K3=E32,E38,E44,E48,E80; K2=E105

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
403)	6737	TEST366A	9209	7434	SR LEFT 1, D[C]="0"; SR=(112524) AFTER; (GUARD/DIS)				
					7005	K4/99	../..	../..	FI; K4=E80
					7400	K4/99	../..	../..	FI; K4=E45
					7421	K4/99	../..	../..	FI; K4=E52,E71,E86
404)	6740	TEST504C	11667	7403	BUTR(FLTPT-PROC-H), FLTPT-PROC-H="1"				
					7402	K2/65	K3/35	../..	FI; K2=E101,E106,E119; K3=E64
405)	6741	TEST365B	9187	7401	CHECK GUARD NOT ALTERED ON SR/RIGHT-GUARD/DISABLED SHIFT				
					7402	K4/99	../..	../..	FI; K4=E30,E53,E80
406)	6742	TEST503I	11495	7402	BUTR(FLTPT-FD-H), FLTPT-FD-H="0"				
					7403	K3/99	../..	../..	FI; K3=E64
					7756	K2/99	../..	../..	FI; K2=E40
407)	6743	TEST365A	9146	7434	SR RIGHT 1, D<00>="1"; SR=(145252) AFTER				
					7400	K4/99	../..	../..	FI; K4=E10,E17,E36,E45
					7420	K4/99	../..	../..	FI; K4=E52
408)	6744	TEST506C	12054	7407	BUTM(PS03), PS<03>H="1"				
					7406	K2/80	K3/20	../..	K210=MULTIPLE-BUT; K306=PS[CC]
409)	6745	TEST364B	9119	7401	BUT(GD3-2), GD<3:0>="0101" AFTER SR/RIGHT, SR<00>="0"				
					74??	K4/99	../..	../..	K408=SR/RES/GUARD-LOGIC
410)	6746	TEST500D	11136	7402	IR PATTERN LOOP: 'OVERLAP-L' ASSERTED SAME # TIMES TO ASPLO AND BSPLO				
					7401	K4/99	../..	../..	FI; K4=E99
411)	6747	TEST364A	9091	7402	BUT(GD3-2), GD<3:0>="1010" AFTER SR/RIGHT, SR<00>="1"				
					74??	K4/99	../..	../..	K408=SR/RES/GUARD-LOGIC
412)	6750	TEST504D	11688	7475	BUT(INSTR1), IR=(172525), CLASS-A(FLTPT), FLAG<4:5>H="01"				
					747?	K3/99	../..	../..	K305=FLAGS/FP-INSTR1
413)	6751	TEST363B	9069	7401	BUT(GD3-2), GD<3:0>="0100" AFTER SR/RIGHT, SR<00>="0"				
					7400	K3/60	K4/40	../..	FI; K3=E54; K4=E53
					7403	K4/99	../..	../..	FI; K4=E53
414)	6752	TEST534G	13844	7402	B.M. COUNTER CLEARED TO ZEROS BY BUTA(LAST)				
					7400	K4/65	K2/35	../..	FI; K4=E87,E90-E91; K2=E55
					7637	K2/70	K3/30	../..	FI; K2=E22-E24,E49-E51,E73-E75; K3=E6,E9,E13,E19
415)	6753	TEST363A	9033	7434	SR RIGHT 1, D<00>="0"; SR=(052525) AFTER				
					7400	K4/99	../..	../..	FI; K4=E10,E17,E24,E45,E74,E85,E94
			[Continued]		7410	K4/99	../..	../..	FI; K4=E47

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/%%	#2/%%	#3/%%	Test summary - Print reference - Chip information
	6753	TEST363A	[Continued]		SR RIGHT 1, D<00>="0"; SR=(052525) AFTER				
					7417	K4/99	../..	../..	FI; K4=E36
					7420	K4/99	../..	../..	FI; K4=E52
					7426	K4/99	../..	../..	FI; K4=E35
416)	6754	TEST506B	12034	7402	BUTR(PS15), PS<15>H="0"				
					7403	K3/99	../..	../..	FI; K3=E54
417)	6755	TEST362E	9010	7402	BUT(GD3-2), GD<3:0>="1000" AFTER SR/RIGHT, SR<00>="1"				
					7400	K4/80	K3/15	K2/5	FI; K4=E26,E28-E30,E47,E53,E55,E71,E80,E86; K3=E1-E3,E12-E13,E56; K2=E39,E54
418)	6756	TEST503J	11513	7406	BUTM(D00), D=(000000)				
					7407	K2/99	../..	../..	FI; K2=E112
419)	6757	TEST362D	8989	7405	BUTR(SR1-0#COUNT), SR<1:0>="10"				
					4747	K2/99	../..	../..	FI; K2=E46,E55
					74??	K4/99	../..	../..	K408=SR/RES/GUARD-LOGIC
420)	6760	TEST504E	11716	7402	EXFLAGS<2:1>H="10", READ THRU CUA-PORT, PROC-MUX				
					7400	K2/99	../..	../..	FI; K2=E103,E106,E111-E112
421)	6761	TEST702B	16089	7402	LOAD BA<17:16>="10", 18. BIT MODE, READ THRU STATUS-MUX(SERVICE)<9:8>				
					7400	K6/55	K4/25	K7/10 K5/10	FI; K6=E11,E51-E54; K4=E65; K7=E56; K5=E26, E60
422)	6762	TEST520D	13417	7402	INSTR-BRANCH-L="L", IR=(101401)=BLOS, PS[NZVC]=(01)				
					740?	K3/99	../..	../..	K2=PS[CC]-BRANCH(E64,72-73,83)
423)	6763	TEST362B	8962	7434	SR=(125252), D[C]="0"; SR/XMUX=(000052) (FLTPT)				
					7400	K4/99	../..	../..	FI; K4=E46,E55,E78
					7420	K4/99	../..	../..	FI; K4=E37
					7421	K4/99	../..	../..	FI; K4=E44
					7424	K4/99	../..	../..	FI; K4=E44
424)	6764	TEST520B	13360	7402	INSTR-BRANCH-L="L", IR=(003000)=BGT, PS[NZVC]=(00)				
					7403	K3/99	../..	../..	FI; K3=E64,E83
					740?	K3/99	../..	../..	K2=PS[CC]-BRANCH(E64,72-73,83)
425)	6765	TEST362A	8917	7434	SR RIGHT 1, D<00>="1"; SR=(125252) AFTER				
					7400	K4/99	../..	../..	FI; K4=E3,E13,E22,E24,E29,E35-E36,E45,E52,E55,E74, E76,E85,E94,E104
426)	6766	TESTA504A	11621	7402	LOAD/READ FLAG#FPS=(052525) FLAG-PORT PROC-MUX; UCON FUNCTION				
					7400	K2/90	K3/10	../..	FI; K2=E78,E98-E99,E101-E103,E105-E108,E110-E114, E119; K3=E27,E47,E94,E96
					7403	K2/99	../..	../..	FI; K2=E106,E108

Module codes: K1/DCS K2/UWORD K3/IRDECODE K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

###)	ERROR code	Symbolic label	Line number	ENUA	TNUA	->Module sequence-> #1/XX	#2/XX	#3/XX	Test summary - Print reference - Chip information
427)	6767	TEST361E	8894	7400	BUT(GD3-2), GD<3:0>="0000" AFTER ENABLED, SR/LOAD				
					7401	K4/80	K2/15	K3/5	FI; K4=E17,E28,E30,E53,E80,E86-E87; K2=E33,E45, E51; K3=E54
					7402	K4/90	K3/10	../..	FI; K4=E26,E30,E53,E87; K3=E56
					7404	K3/99	../..	../..	FI; K3=E74
428)	6770	TEST701C	15981	7402	LOAD BA<15:00>=(125252), READ THRU BA/KT-ALU/PBA/STATUS-MUX(PBA)				
					7400	K5/50	K4/15	K6/15	K7/15 FI; K5=E7,E9-E11,E27,E37-E38,E43,E45-E47, E50,E59,E69-E70,E72,E79-E82,E94; K4=E39,E48,E57; K6=E19,E25,E29,E33,E49,E59; K7=E56,E64-E65,E73, E80-E82,E88
					7401	K7/50	K4/50	../..	FI; K7=E88; K4=E29
					7403	K5/65	K6/20	K7/10	FI; K5=E7,E26-E27,E46-E47; K6=E25,E59; K7=E80
429)	6771	TEST361D	8873	7403	BUTR(SR1-0#COUNT), SR<1:0>="01"				
					6377	K2/65	K3/35	../..	FI; K2=E4-E5,E58-E59; K3=E1,E16
					7407	K3/99	../..	../..	FI; K3=E74
					74??	K4/99	../..	../..	K408=SR/RES/GUARD-LOGIC
430)	6772	TEST520C	13388	7403	INSTR-BRANCH-L="H", IR=(002416)=BLT, PS[NZVC]=(16)				
					7402	K3/99	../..	../..	FI; K3=E72,E83
					740?	K3/99	../..	../..	K2=PS[CC]-BRANCH(E64,72-73,83)
431)	6773	TESTD410	10707	7361	(NUA SEQUENCING LOGIC ERROR)				
					6777	K2/99	../..	../..	FI; K2=E48
					????	K1/99	../..	../..	INTERNAL DCS ERROR
432)	6775	TEST520E	13445	7403	INSTR-BRANCH-L="H", IR=(103406)=BLO, PS[NZVC]=(06)				
					7402	K3/99	../..	../..	FI; K3=E83
					740?	K3/99	../..	../..	K2=PS[CC]-BRANCH(E64,72-73,83)

KD11 Module code ERO K1/D080A-K2/0000:03K3/2R000002 K4/DATAPATH K5/KTCACHE K6/TIMING K7/STATUS

1
2
3
4
5
6 I D E N T I F I C A T I O N
7
8
9
10 PRODUCT CODE: MAINDEC-11-DQKUB-B0
11

PRODUCT CODE: MAINDEC-11-DQKUB-B0

PRODUCT NAME: KD11-K Microdiagnostic

MAINTAINER: Diagnostic Engineering

F07

AUTHOR: Don North

DATE CREATED: 18-January-1977

LAST REVISION: 15-June-1977, Version /101/

COPYRIGHT (C) 1976, 1977; DIGITAL EQUIPMENT CORPORATION
146 MAIN STREET
MAYNARD, MASSACHUSETTS, USA
01754 617-897-5111

THIS SOFTWARE IS FURNISHED TO THE PURCHASER UNDER A LICENSE FOR USE ON A SINGLE COMPUTER SYSTEM, AND CAN BE COPIED (WITH INCLUSION OF DIGITAL'S COPYRIGHT NOTICE) ONLY FOR USE IN SUCH SYSTEM, EXCEPT AS MAY OTHERWISE BE PROVIDED IN WRITING BY DIGITAL.

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE, AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT CORPORATION. DIGITAL EQUIPMENT CORPORATION ASSUMES NO RESPONSIBILITY FOR ANY ERRORS THAT MAY APPEAR IN THIS DOCUMENT.

DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF ITS SOFTWARE ON EQUIPMENT NOT SUPPLIED BY DIGITAL.

TABLE OF CONTENTS

59 -- IDENTIFICATION
94 -- REVISION HISTORY
106 -- MICROWORD FIELD DEFINITIONS
129 -- MICROWORD BIT LAYOUT
187 -- A & B & C SCRATCHPAD LAYOUT, DCS SPECIFIC
243 -- MICROWORD FIELD SPECIFICATION
248 -- MICROWORD FIELD FORMAT
260 -- NULL FIELD/MACRO SPECIFICATION
266 -- ALU AND INTERNAL DATA BUS CONTROL
270 -- <ALU>-ALU FUNCTION CONTROL BITS
295 -- <BEN>-B-BUS DATA SOURCE
305 -- <BSEL>-B-BUS SOURCE SELECTION CONTROL
345 -- <AEN>-A-BUS DATA SOURCE
355 -- <ASEL>-A-BUS SOURCE SELECTION CONTROL
398 -- <RIF>-ASP, BSP REGISTER IMMEDIATE FIELD
435 -- <COUT>-CARRY OUT BIT MUX SELECTION
451 -- CLOCKS
455 -- <WHEN>-D/SR WHEN TO CLOCK
463 -- <CLKD>-ENABLE D-REGISTER CLOCKING
471 -- <CLKSR>-ENABLE SR-REGISTER CLOCKING
479 -- <CLKBA>-ENABLE CLOCKING OF BA-REGISTER
487 -- <SCC>-ENABLE SETTING OF PS CONDITION CODES
498 -- BUS/UCON & CSP-ADDRESS & SHIFT-TREE CONTROL
502 -- BUS/UCON CONTROL
505 -- <BEGIN>-BEGIN BUS/UCON OPERATION
513 -- <SELECT>-SELECT BUS OR UCON
521 -- BUS CONTROL
524 -- <BUSCODE>-BUS CODE ACTION FIELD
540 -- UCON CONTROL
544 -- <FLPGO>-START HOT FLOATING POINT
552 -- <UCON-XFER>-UCON OPERATION
560 -- <UCON-LOAD>-LOAD UCON REGISTER
568 -- CSP ADDRESS SPECIFICATION
571 -- <CSPADDR>-CSP IMMEDIATE ADDRESS
597 -- SHIFT CONTROL
600 -- <BMUX>-SECOND LEVEL OF SHIFT TREE
608 -- <AMUX>-FIRST LEVEL OF SHIFT TREE
625 -- SP REWRITE & REGISTER CLOCKS
629 -- <WRCSP>-WRITE TO CSP
637 -- <MOD>-MODE CONTROL OF FOLLOWING BITS
645 -- SP REWRITE [A,B] CONTROL
649 -- <HILO>-SP HI/LO SELECT
659 -- <WRSEL>-REWRITE ADDRESS SELECT
669 -- <WRSP>-REWRITE A/B SELECT
688 -- REGISTER LOADING
692 -- <LOADRES>-LOAD RESIDUAL CONTROL REGISTER
701 -- <LOADCOUNT>-LOAD COUNTER
711 -- SEQUENCING FIELD
715 -- <UBF>-BUT MICROBRANCH FIELD
719 -- NO BUT

TABLE OF CONTENTS

722 -- ACTIVE ONLY
739 -- INACTIVE ONLY
810 -- BOTH ACTIVE AND INACTIVE
831 -- <UPF>-MICRO POINTER FIELD
874 -- MISCELLANEOUS FIELDS
878 -- <NEXT-PAGE>-NEW PAGE ADDRESS LOADED DURING BUT[SUBROUTINE]
884 -- <MULTIPLE>-SELECT CODE FOR BUT[MULTIPLE]
898 -- EMIT FIELD - IMMEDIATE DATA FROM MICROWORD
925 -- RETURN ADDRESS - FOR MICROSUBROUTINE CALLS
931 -- UCON SELECTION AND CONTROL FIELDS
934 -- SELECTION
957 -- CONTROL
979 -- BASE MACHINE EXTENSION BITS
1052 -- SPECIAL DCS FIELDS
1056 -- FIELDS USED IN PAGES 4, 5, OR 6 OF DCS
1059 -- <LOAD-DCS-CTR>-LOAD DIAGNOSTIC COUNTER FROM EMITH
1072 -- <CTR>-4 BIT DCS COUNTER VALUE FROM EMIT
1096 -- <LOAD-ENUA-ERRCOD>-LOAD THE ENUA AND ERRCOD REGISTERS
1106 -- <ENUA>-ENUA VALUE FROM EMIT
1113 -- <VERIFY>-VERIFY BIT FOR SELF CHECK TEST
1125 -- FIELDS USED IN PAGE 7 OF DCS EXTENSION
1128 -- <EOP>-SIGNAL SUCCESSFUL END OF PASS
1137 -- <DAD>-DCS CONTROL OF BASE MACHINE EXTENSION DAD BITS
1149 -- FIELDS USED IN ALL PAGES OF DCS EXTENSION
1152 -- <SCOPE>-SCOPE ON ERROR, DIAGNOSTIC BUT
1170 -- MACRO DEFINITIONS
1173 -- PRIMITIVE OPERATIONS
1176 -- TIMING
1210 -- WRITING THE A AND B SCRATCH PADS
1234 -- ASP AND BSP PHYSICAL REGISTER ADDRESSES
1266 -- ASP AND BSP BASE MACHINE FUNCTIONAL REGISTER ADDRESSES
1339 -- ASP AND BSP INDIRECT REGISTER ADDRESSES
1364 -- ASP, BSP INDIRECT ADDRESSING
1377 -- ASP AND BSP DCS SPECIFIC FUNCTIONAL REGISTER ADDRESSES
1401 -- WRITING THE C SCRATCH PAD
1410 -- CSP IMPLIED ADDRESSING
1422 -- CSP DIRECT ADDRESSING
1436 -- SHIFT TREE SPECIFICATION
1440 -- ENABLED ONTO BUS A
1471 -- FIRST TWO LEVELS ONLY [AMUX,BMUX]
1479 -- ALU FUNCTIONS
1500 -- COUT GENERATION
1515 -- CLOCKS
1519 -- BASIC REGISTER CLOCKS [D, SR, BA, CC]
1528 -- REDEFINED FROM SP REWRITE FIELD [RES, COUNTER]
1534 -- RES REGISTER CONTROL VALUES [FROM EMIT]
1548 -- CC CONTROL [FROM EMIT]
1557 -- BUS CONTROL MACROS
1571 -- KT/KJ CONTROL FUNCTIONS
1589 -- UCON CONTROL MACROS

TABLE OF CONTENTS

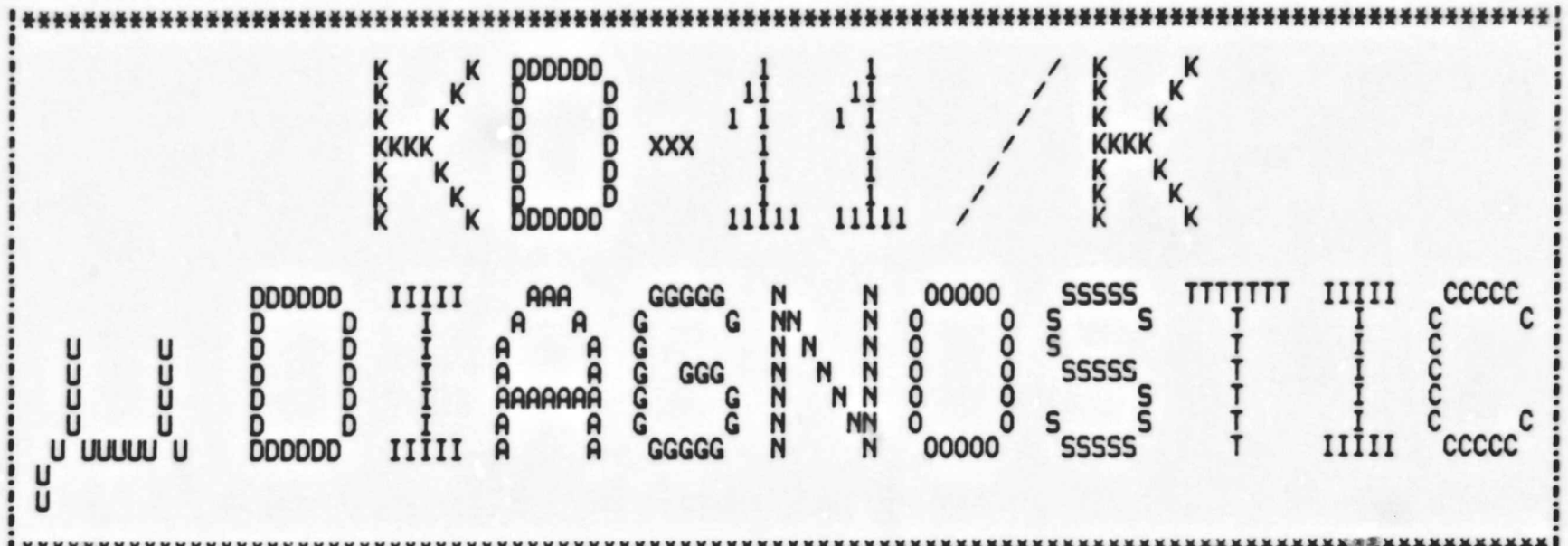
1595 -- PROCESSOR UCON CONTROL SETUP
1613 -- DCS/WCS/ECS CONTROL
1621 -- CACHE/KT UCON CONTROL
1641 -- I/O UCON CONTROL
1646 -- BUS CONTROL
1666 -- CONSOLE I-O
1682 -- REMOTE CONSOLE INTERFACE
1692 -- DCS ROM EXTENSION MACROS
1694 -- GENERAL FUNCTIONS
1705 -- DAD<1:0> BIT FUNCTIONS
1714 -- DIAGNOSTIC MODE BUT ENABLES
1732 -- MICROBRANCH FIELD MACROS
1748 -- MISCELLANEOUS
1750 -- OTHER SOURCES ENABLED FOR A-BUS
1756 -- PAGING, RETURN REGISTER
1771 -- ADVANCED OPERATIONS
1775 -- DATA INTO CSP, AT P3 ONLY
1821 -- MISC CONSTANTS INTO ASP, BSP, AT P2-T * P3
1849 -- DATA INTO ASP, BSP, AT P2-T * P3
2055 -- D AND SR <- (BUS-A FCN BUS-B), AT P2-T OR P3-T
2098 -- D[C] GETS SET
2116 -- D-REGISTER <- [BBUS = ABUS], BITWISE, AT P2-T OR P3-T
2153 -- D-REGISTER <- D-REGISTER THRU SHIFT-TREE
2187 -- D <- WHATEVER'S LEFT, AT P2-T OR P3-T
2234 -- SR <- DATA, AT P2 T OR P3 T
2269 -- RES-REG OPERATION MACROS
2278 -- BASE MACHINE COUNTER
2286 -- ENABLE ON BUS-A/B ONLY
2312 -- LOADING BA REGISTER
2325 -- D AND SR TOGETHER
2333 -- UCON FUNCTIONS
2337 -- PROCESSOR UCON FUNCTIONS
2364 -- CACHE/KT UCON FUNCTIONS
2390 -- I-O UCON FUNCTIONS
2406 -- DCS UCON FUNCTIONS
2413 -- CONSOLE UCON FUNCTIONS
2428 -- DBUF UCON FUNCTIONS
2437 -- MULTIPLE UCON FUNCTIONS
2452 -- SPECIFIC MACROS FOR PREFETCH/OVERLAP/SP-INHIBIT TESTS
2479 -- SPECIFIC MACROS FOR BYTE/BYTE CONSTANT/D=ZERO TESTS
2498 -- SUBROUTINE CALL MACROS
2568 -- JAM UPP LOG MACROS
2585 -- - - - MICRODIAGNOSTIC CODE -
2602 -- TEST001-007: MUA SEQUENCING
2775 -- TEST010-011: MICROSUBROUTINE OPERATION
2906 -- INIT REGISTERS, CONSOLE DEFAULT ERROR DISPLAY, REVISION CODE
2996 -- TEST012-050: IR DECODE (INSTR1, INSTR5, FLTPT, RELATED "BUTS")
5139 -- TEST101: D -> DBUF -> IR PATH
5188 -- TEST102-104: TESTING CSP ADDRESS/READ/WRITE FUNCTIONS
5573 -- TEST105: SR CAN LOAD/STORE AS A REGISTER

TABLE OF CONTENTS

5772 -- TEST114-121: ALU LOGIC TESTS / D[C] TESTS
7236 -- TEST130-136: ALU ARITHMETIC FUNCTION/CARRY LOOKAHEAD TESTS
8078 -- TEST320: D[C] SELECTION / COUT07=DOUT07 / D<14:00>=ZERO@BIT<00>
8286 -- TEST350-352: ASP/BSP HI/LO ADDRESSING MODES, DATA VALIDITY
8800 -- TEST361-372: TESTING SR, GUARD, BES, AND XMUX
9585 -- TEST372A-372B: TESTING CUA, PROCESSOR MUX, AND BUTA[SUBR A]
9712 -- TEST373: CHECK JAMUPP W/ BUTA(DIAGNOSE), BM EXT BIT FLPADR
9840 -- TEST374: A/B SP REWRITE MODES VERIFICATION
10488 -- TEST375-376: BYTE WRITE TO ASP/BSP LO, SP ADDRS R-OR-1/FLTPT-INHIBIT
10645 -- TEST410: BYTE/BYTE CONSTANT/D=ZERO
10954 -- TEST500: PREFETCH/OVERLAP/SP DEFEAT
11206 -- TEST503-510: PROCESSOR UCON TESTS (FLAGS, FPS, PS, BUTM) & ASSOC LOGIC
12636 -- TEST511: MFSS LOGIC TESTS
12868 -- TEST512: KT SRC/DST ADDRESSING LOGIC TESTS
13288 -- TEST520A-520E: TESTING THE "INSTR BRANCH" ROM
13506 -- TEST533-537: SHIFT TREE
14448 -- TEST551: BASE MACHINE DATAPATH COUNTER CAN COUNT
14702 -- TEST610: CONDITION CODE LOGIC
15234 -- TEST620-624: TESTING UBREAK AND JAMUPP
15901 -- TEST701-702: LOAD/READ THE BA, FULL 18. BITS
16132 -- TEST710-722: BUS FUNCTION DECODE, BUS ERROR CONDITIONS
17056 -- TEST730-731: BUS CYCLES TO/FROM MEMORY
17523 -- TEST740: BUS CYCLE MODIFICATION - PREFETCH ALTERATION, OVERLAP YANK
17687 -- TEST761-763: TESTING UNIBUS INTERRUPT SERVICE WITH DL11-W LINE CLOCK
18191 -- END OF PASS CODE
18294 -- VERIFY MODE CODE
18352 -- DCS MICROCODE REVISION NUMBER
18394 -- COMMON SUBROUTINES
18396 -- CONSOLE DISPLAY SUBROUTINE
18445 -- CLEAR I-O / BUS CONTROL / SERVICE AREA STATUS LATCHES SUBR
18491 -- SUBR FOR PUTTING SELECTED PORTIONS OF D[15-00] INTO IR
18570 -- UCON SUBROUTINES (FLAGS, PS, FPS, CUA, SERVICE, JAM, PBA)
18691 -- SUBR FOR LOADING FPS<3:0> [VIA BUTA(DIAGNOSE)]
18738 -- SUBR TO COPY D-REGISTER TO DBUF TO IR
18810 -- JAM UPP SERVICE SUBROUTINE
18894 -- MICROBRANCH [BUT] TAKEOFF WORDS
19233 -- MICROBRANCH [BUT] TARGET WORDS
19766 -- END OF KD11-K MICRODIAGNOSTIC CODE

```
!.PAGE=========================================================================================================

.TOC   * IDENTIFICATION
!
.TITLE KD11-K MICRODIAGNOSTIC
```




```
!.PAGE=========================================================================================================

.TOC   * REVISION HISTORY

.IDENT /V101A0/

        REV-NUMBER          ::=  000101         !NO BIT15 DURING EXECUTION
        REV-NUMBER-AND-B15  ::=  100101         !BUT SET W/REV. NUMBER AT EOP ONLY


!.PAGE=========================================================================================================

.TOC   * MICROWORD FIELD DEFINITIONS

!       NOTE:   THE FOLLOWING ARE THE ASSIGNED RANGES OF THE
```

```
!               MICROWORD FIELD BIT DEFINITIONS USED IN THIS
!               SOURCE LISTING:
!
!               BITS[NUMBER]        WHERE HELD
!               ------------        ----------------------------
!
!               [47:00] 48/48       MAIN MACHINE ROM,
!                                   DCS MAIN ROM
!               [59:48] 12/12 *     MAIN MACHINE ROM EXTENSION,
!                                   USES 12/12 BITS
!               [54:48] 7/12 *      DCS 4-BIT ROM EXTENSION,
!                                   USES 7/12 BITS, [54:48]
!
!       * = NOTE OVERLAP OF BM EXTENSION/DCS EXTENSION BITS.
!               THESE BITS ARE MUTUALLY EXCLUSIVE.


!.PAGE=========================================================================================================

.TOC    * MICROWORD BIT LAYOUT
!       BASE                1-EMIT                                  6-RETURN                                        UCON
!       MACHINE             2-SHIFT-TREE    4-UCON-DATA             7-PAGING            9-RES-BITS      DCS     PROCESSOR
!       CONTROL             3-RESIDUAL-CTL  5-CSP-ADDRESS           8-UCON-CONTROL      10-MULTIPLE     EXTENSION       CONTROL
!       -------             --------------  -------------           --------------      -----------     -------------   -----------
!U47    ALU3                1-EMITH15       4-UCONL10                                                   DCS-CTR3        PS<3:0>-CLK
!U46    ALU2                1-EMITH14       4-UCON-I/O-SEL          6-RETR11            9-HISMUXSELL    DCS-CTR2
!U45    ALU1                1-EMITH13       4-UCON-WCS-SEL          6-RETR10            9-SRS1-L        DCS-CTR1
!U44    ALU0                1-EMITH12       4-UCON-KT-SEL           6-RETR09            9-SRS0-L        DCS-CTR0
!U43    BEN1                                                                                                UBREAK-CLK
!U42    BEN0                                4-UCONL09                                                       <NU>
!U41    BSEL1               1-EMITM11       4-UCONL08               6-RETR08            9-GUARD-EN-H    ENUA11          <NU>
!U40    BSEL0               1-EMITM10       4-UCONL07               6-RETR07                            ENUA10          SEL-HBMUX1L
!U39    AEN1                1-EMITM09       4-UCONL06               6-RETR06                            ENUA09          SEL-HBMUX0L
!U38    AEN0                1-EMITM08       4-UCONL05               6-RETR05                            ENUA08
!U37    ASEL1               1-EMITL07                               6-RETR04                            ENUA07
!U36    ASEL0               1-EMITL06       4-UCON-PROC-SEL         6-RETR03                            ENUA06          FPS<7:4>-CLK
!U35    RIF2                1-EMITL05       4-UCONM12               6-RETR02                            ENUA05          PS<7:4>-CLK
!U34    RIF1                1-EMITL04       4-UCONM11               6-RETR01                            ENUA04
!U33    RIF0                1-EMITL03       4-UCON-FP-SEL           6-RETR00                            ENUA03          IR-CLOCK
!U32    COUT2               1-EMITL02       4-UCONH15               7-NEXT-PAGE2        10-MULT-SEL2    ENUA02          PS<15:12>-CLK
!U31    COUT1               1-EMITL01       4-UCONH14               7-NEXT-PAGE1        10-MULT-SEL1    ENUA01          FLAG<8:0>-CLK
!U30    COUT0               1-EMITL00       4-UCONH13               7-NEXT-PAGE0        10-MULT-SEL0    ENUA00
!U29 *  WHEN
!U28 *  CLK-D
!U27 *  CLK-SR
!U26 *  CLK-BA
!U25 *  SET-CC
!U24 *  BEGIN
!U23    SELECT(=0)          2-BMUX          5-CSPADR3               8-SELECT(=1)
!U22    BUSCOD2             2-AMUX2         5-CSPADR2               8-FLPGO
!U21    BUSCOD1             2-AMUX1         5-CSPADR1               8-UCON-XFER
!U20    BUSCOD0             2-AMUX0         5-CSPADR0               8-UCON-LOAD
!U19 *  WRCSP
```

```
!U18   HI/LO          3-LOAD-RES
!U17   WRSEL
!U16   WR8            3-LOAD-COUNT
!U15   WRA
!U14 * MOD(=0)        3-MOD(=1)
!U13 * UBF4
!U12 * UBF3
!U11 * UBF2
!U10 * UBF1
!U09 * UBF0
!U08 * UPF8
!U07 * UPF7
!U06 * UPF6
!U05 * UPF5
!U04 * UPF4
!U03 * UPF3
!U02 * UPF2
!U01 * UPF1
!U00 * UPF0           ( * = DEDICATED TO THE CORRESPONDING SINGLE FUNCTION )
```

```
!.PAGE=========================================================================================================
.TOC   * A & B & C SCRATCHPAD LAYOUT, DCS SPECIFIC
!
!      THE USE OF THE A, B, & C SCRATCHPADS AS TEMPORARY STORAGE AREAS
!      IS OUTLINED BELOW.  NOTE THAT IN MOST CASES, THE REGISTERS
!      EMPLOYED HAVE NO RESEMBLANCE  TO ANY SIMILAR NAMED REGISTER
!      IN THE KD11-K BASE MACHINE MICROCODE, EITHER LIVING OR DEAD.
!
!      THE BELOW DEFINITIONS ARE -DCS SPECIFIC- ONLY.
!
!
!      OCTAL
!      ADDRESS     ASPHI        ASPLO        BSPHI        BSPLO        CSP
!
!        00        . . .        . . .        . . .        . . .        <RETURN>
!
!        01        (000000)     . . .        (000000)     . . .        TEMP/(000152)
!
!        02        . . .        . . .        . . .        . . .        TEMP/(000125)
!
!        03        (177777)     . . .        (177777)     . . .        TEMP
!
!        04        . . .        . . .        . . .        . . .        TEMP/(125200)
!
!        05        (125252)     . . .        (125252)     . . .        TEMP/(052522)/(170360)
!
!        06        . . .        . . .        . . .        . . .        TEMP/(053433)/(007417)
!
!        07        (052525)     . . .        (052525)     . . .        TEMP
!
!        10        . . .        . . .        . . .        . . .        (052525)
```

```
!
!     11          (000001)      . . .     (000001)      . . .     (125252)
!
!     12          . . .         . . .     . . .         . . .     (177777)
!
!     13          (100000)      . . .     (100000)      . . .     (000000)
!
!     14          . . .         . . .     . . .         . . .     TEMP/(000100)/(057077)
!
!     15          (000200)      . . .     (000200)      . . .     TEMP/(000077)/(177067)
!
!     16          . . .         . . .     . . .         . . .     TEMP/(170000)
!
!     17          TEMPAHI       TEMPALO   TEMPBHI       TEMPBLO   TEMP/(007700)
!
!
!     NOTES:  (XXXXXX) ::= A REGISTER W/ A CONSTANT VALUE, NAMED:
!             CXXXXXX-A, IF ON THE A-SIDE, OR
!             CXXXXXX-B, IF ON THE B-SIDE
!


!.PAGE=============================================================================================

.TOC    * MICROWORD FIELD SPECIFICATION

!-------------------------------------------------------------------------------

.TOC    *   MICROWORD FIELD FORMAT

.RADIX 8                        ! ALL NUMBERS ARE OCTAL, UNLESS OTHERWISE NOTED

.WIDTH 64R                      ! MICROWORD IS 64\10 BITS WIDE, BIT <00> IS RIGHTMOST BIT

.BOUNDS         [4000:7777]             ! ADDRESSES ARE 12 BITS, ON PAGES 4:7

!.OBJECT  <15:00>'<31:16>'<47:32>'<63:48>              ! OUTPUT FORMAT (DEFAULT SPEC)

!-------------------------------------------------------------------------------

.TOC    *   NULL FIELD/MACRO SPECIFICATION

.FIELD N:=<63>
.MACRO NULL:=N/0

.TOC    *   ALU AND INTERNAL DATA BUS CONTROL


.TOC    *     <ALU>-ALU FUNCTION CONTROL BITS
```

```
271     !SPECIFIES ALU FUNCTION CODE AND CINMUX SELECT. ALWAYS IN EFFECT.
272     .FIELD ALU::=<47:44>
273     !                                   ---FUNCTION---      LOGIC/ARITH  ALUS<3:0> H     CINMUX L
274             NOT-A::=00                  !COMPLEMENT A,            L          0000          -1
275             A-PLUS-B-PLUS-PS[C]::=01    !ADD,                     A          1001          -PS[C]
276             NOT-A-AND-B::=02            !AND,                     L          0010          -PS[C]
277             ZERO::=03                   !ZERO,                    L          0011          -PS[C]
278             A-PLUS-B-PLUS-D[C]::=04     !PLUS,                    A          1001          -D[C]
279             A-PLUS-NOT-B-PLUS-D[C]::=05 !PLUS,                    A          0110          -D[C]
280             A-XOR-B::=06                !XOR,                     L          0110          -D[C]
281             A-AND-NOT-B::=07            !AND,                     L          0111          -D[C]
282             DIVIDE::=10                 !DIVIDE STEP,
283                                         !SUB,    IF D[C]H=1       A          0110          -D[C]=-1
284                                         !ADD,    IF D[C]H=0       A          1001          -D[C]=-0
285             A-PLUS-B::=11               !PLUS,                    A          1001          -0
286             B::=12                      !SELECT B,                L          1010          -0
287             A-AND-B::=13                !AND,                     L          1011          -0
288             A-PLUS-B-PLUS-1::=14        !PLUS,                    A          1001          -1
289             A-MINUS-B::=15              !MINUS,                   A          0110          -1
290             A-IOR-B::=16                !IOR,                     L          1110          -1
291             A::=17                      !SELECT A,                L          1111          -1
292
293
294
295     .TOC    *     <BEN>-B-BUS DATA SOURCE
296     !SPECIFIES GATING OF DATA ONTO B-BUS. ALWAYS IN EFFECT.
297     .FIELD BEN::=<43:42>
298             BSPLO::=0                   !DIRECT BSP LOCATIONS 00-17
299             BSPHI::=1                   !DIRECT BSP LOCATIONS 20-37
300             CSP::=2                     !USE <CSPADDR> [SIC] AS ADDRESS (4 BIT)
301             BASCON::=3                  !1 OF 4 BASE CONSTANTS IN CSP17 TO CSP14 (2 BIT)
302
303
304
305     .TOC    *     <BSEL>-B-BUS SOURCE SELECTION CONTROL
306     !SPECIFIES CONTROL OF INDIVIDUAL B-BUS SOURCES. ALWAYS IN EFFECT.
307     .FIELD BSEL::=<41:4C>
308     !NOT USED WHEN BEN/CSP
309     !CSP17 TO CSP14 IMMEDIATE ADDRESS WHEN BEN/BASCON
310             B17::=0                     !
311             B16::=1                     !
312             B15::=2                     !
313             B14::=3                     !
314     !USED IN CONJUNCTION WITH <RIF> FOR SP ADDRESS WHEN BEN/BSPLO OR BEN/BSPHI
315             DF::=0                      !DESTINATION FIELD
316             SF::=1                      !SOURCE FIELD
317             IMMEDO::=2                  !DIRECT ADDRESS, LOW BIT=0
318               R00::=2                   !FOR JOINT USE W/ RIF FIELD
319               R02::=2                   !
320               R04::=2                   !
321               R06::=2                   !
322               R10::=2                   !
323               R12::=2                   !
324               R14::=2                   !
```

```
                R16:=2                  !
               IMMED1:=3                !DIRECT ADDRESS, LOW BIT=1
                 R01:=3                 !FOR JOINT USE W/ RIF FIELD
                 R03:=3                 !
                 R05:=3                 !
                 R07:=3                 !
                 R11:=3                 !
                 R13:=3                 !
                 R15:=3                 !
                 R17:=3                 !
               C000000:=3               !ASPHI/BSPHI CONSTANTS
               C177777:=3               !
               C125252:=3               !
               C052525:=3               !
               C000001:=3               !
               C100000:=3               !
               C000200:=3               !

.TOC    *      <AEN>-A-BUS DATA SOURCE
!SPECIFIES GATING OF DATA ONTO A-BUS. ALWAYS IN EFFECT.
.FIELD AEN:=<39:38>
               XMUX:=0                  !XMUX=SR OR FLTPT ASSEMBLE
               CMUX:=1                  !SHIFT TREE
               ASPLO:=2                 !DIRECT ASP LOCATIONS 00-17
               ASPHI:=3                 !DIRECT ASP LOCATIONS 20-37


.TOC    *      <ASEL>-A-BUS SOURCE SELECTION CONTROL
!SPECIFIES CONTROL OF INDIVIDUAL A-BUS SOURCES. ALWAYS IN EFFECT.
.FIELD ASELO:=<36>
!XMUX CONTROL WHEN AEN/XMUX  [USES ASELO ONLY]
               SR:=0                    !SR OUTPUT ONTO BUS-A
               FLTPT:=1                 !FLTPT-ASSEMBLE ONTO BUS-A
.FIELD ASEL:=<37:36>
!CMUX CONTROL WHEN AEN/CMUX.  SHIFTS CMUX INPUT APPROPRIATE AMOUNT
               LEFT-1:=0                !LOW BIT GETS SENDMUX OUTPUT
               DIRECT:=1                !OUTPUT=INPUT
               RIGHT-1:=2               !HIGH BIT GETS D[C]
               RIGHT-2:=3               !HIGH BITS BOTH GET D[C]
!USED IN CONJUNCTION WITH <RIF> FOR SP ADDRESS WHEN AEN/ASPLO OR AEN/ASPHI
               IMMED0:=0                !DIRECT ADDRESS, LOW BIT=0
                 R00:=0                 !FOR JOINT USE W/ RIF FIELD
                 R02:=0                 !
                 R04:=0                 !
                 R06:=0                 !
                 R10:=0                 !
                 R12:=0                 !
                 R14:=0                 !
                 R16:=0                 !
               IMMED1:=1                !DIRECT ADDRESS, LOW BIT=1
                 R01:=1                 !FOR JOINT USE W/ RIF FIELD
```

```
                        R03::=1                 !
                        R05::=1                 !
                        R07::=1                 !
                        R11::=1                 !
                        R13::=1                 !
                        R15::=1                 !
                        R17::=1                 !
                      C000000::=1               !ASPHI/BSPHI CONSTANTS
                      C177777::=1               !
                      C125252::=1               !
                      C052525::=1               !
                      C000001::=1               !
                      C100000::=1               !
                      C000200::=1               !
                      DF::=2                    !DESTINATION FIELD
                      SF::=3                    !SOURCE FIELD


.TOC    *     <RIF>-ASP, BSP REGISTER IMMEDIATE FIELD
!SPECIFIES ADDRESSES WITH ASP, BSP ALONG WITH AEN, ASEL & BEN, BSEL
.FIELD RIF::=<35:33>
                      R00-OR-01::=4             !LOW BIT IS 0/1, SPECIFIED BY
                        R00::=4                 !
                        R01::=4                 !
                      R02-OR-03::=5             !USING EITHER IMMED0/IMMED1 MODES
                        R02::=5                 !
                        R03::=5                 !
                      R04-OR-05::=6             !
                        R04::=6                 !
                        R05::=6                 !
                      R06-OR-07::=7             !
                        R06::=7                 !
                        R07::=7                 !
                      R10-OR-11::=0             !
                        R10::=0                 !
                        R11::=0                 !
                      R12-OR-13::=1             !ADDR<3:0>H = -RIF<2>H * RIF<1:0>H * A/BSEL<0>H
                        R12::=1                 !
                        R13::=1                 !
                      R14-OR-15::=2             !
                        R14::=2                 !
                        R15::=2                 !
                      R16-OR-17::=3             !
                        R16::=3                 !
                        R17::=3                 !
                      C000000::=4               !ASPHI/BSPHI CONSTANTS
                      C177777::=5               !
                      C125252::=6               !
                      C052525::=7               !
                      C000001::=0               !
                      C100000::=1               !
                      C000200::=2               !
```

```
433
434
435     .TOC    *       <COUT>-CARRY OUT BIT MUX SELECTION
436     !SPECIFY INPUT TO D[C] REGISTER, LOADED WHEN D REGISTER LOADED.  ALWAYS IN EFFECT.
437     .FIELD COUT::=<32:30>
438             CIN::=0                 !OUTPUT OF CINMUX [SIC]
439             PS[C]::=1               !PS C-BIT
440             ALU00::=2               !ALU OUTPUT BIT 00
441             ALU07::=3               !ALU OUTPUT BIT 07
442             ALU15::=4               !ALU OUTPUT BIT 15
443             COUT07::=5              !BYTE CARRY BIT
444             COUT15::=6              !WORD CARRY BIT
445             D[C]::=7                !PROPOGATE [SAVE] LAST D[C]
446
447     !-------------------------------------------------------------------------------
448
449
450
451     .TOC    *   CLOCKS
452
453
454
455     .TOC    *       <WHEN>-D/SR WHEN TO CLOCK
456     !SPECIFY CLOCK D/SR REGISTERS AT P2 T OR P3 T. ALWAYS IN EFFECT.
457     .FIELD WHEN::=<29>,0
458             AT-P2-T::=0             !CLOCK D AND/OR SR AT P2 T[100 NS].
459             AT-P3-T::=1             !CLOCK D AND/OR SR AT P3 T[150 NS].
460
461
462
463     .TOC    *       <CLKD>-ENABLE D-REGISTER CLOCKING
464     !ENABLES CLOCKING OF D-REGISTER. ALWAYS IN EFFECT.
465     .FIELD CLKD::=<28>,0
466             NO::=0                  !NOP
467             YES::=1                 !CLOCK D[C], D-REGISTER AT <WHEN>
468
469
470
471     .TOC    *       <CLKSR>-ENABLE SR-REGISTER CLOCKING
472     !ENABLES CLOCKING OF SR-REGISTER. ALWAYS IN EFFECT.
473     .FIELD CLKSR::=<27>,0
474             NO::=0                  !NOP
475             YES::=1                 !CLOCK SR-REGISTER AT <WHEN>
476
477
478
479     .TOC    *       <CLKBA>-ENABLE CLOCKING OF BA-REGISTER
480     !ENABLES CLOCKING OF BA-REGISTER AT P1 T[60 NS]. ALWAYS IN EFFECT.
481     .FIELD CLKBA::=<26>,0
482             NO::=0                  !NOP
483             YES::=1                 !CLOCK BA-REGISTER AT P1 T[60 NS].
484
485
486
```

```
487     .TOC   *     <SCC>-ENABLE SETTING OF PS CONDITION CODES
488     !ENABLE CLOCKING OF PS CONDITION CODES AT P2 T[100 NS] OF NEXT UWORD.  D MUST
489     !BE CLOCKED AT P2 T OR EARLIER OF PREVIOUS MICROWORD.   ALWAYS IN EFFECT.
490     .FIELD SCC::=<25>,0
491             NO::=0                  !NOP
492             YES::=1                 !ENABLE CLOCKING IN NEXT UWORD
493
494     !-------------------------------------------------------------------------------
495
496
497
498     .TOC   *   BUS/UCON & CSP-ADDRESS & SHIFT-TREE CONTROL
499
500
501
502     .TOC   *     BUS/UCON CONTROL
503
504
505     .TOC   *       <BEGIN>-BEGIN BUS/UCON OPERATION
506     !INITIATE BUS XOR UCON OPERATION. ALWAYS IN EFFECT.
507     .FIELD BEGIN::=<24>,0
508             NO::=0                  !NOP FOR BUS AND UCON OPERATIONS
509             YES::=1                 !BEGIN OPERATION SPECIFIED
510
511
512
513     .TOC   *       <SELECT>-SELECT BUS OR UCON
514     !SELECT BUS XOR UCON. ONLY USED IF BEGIN/YES.
515     .FIELD SELECT::=<23>
516             BUS::=0                 !SELECT BUS
517             UCON::=1                !SELECT UCON
518
519
520
521     .TOC   *       BUS CONTROL
522
523
524     .TOC   *         <BUSCODE>-BUS CODE ACTION FIELD
525     !BUS ACTION CODES. ONLY USED IF BEGIN/YES & SELECT/BUS.
526     .FIELD BUSCODE::=<22:20>
527             DATI-CLKIR::=0          !DATA IN, LOAD IR
528             DATI-NOINT::=1          !DATA IN, NO INTERNAL ADDRESS
529             DATO::=2                !DATA OUT
530             DATIB::=3               !DATA IN, ALLOW: ODD ADDRESS
531             DATIB[P]::=3            !DATA IN, ALLOW: ODD ADDRESS, FORCE TO PAUSE
532             DATIP::=4               !DATA IN, NO CACHE, LOCK BUS
533             DATOB::=5               !DATA OUT, ALLOW: ODD ADDRESS
534             DATI::=6                !DATA IN
535             DATI[P]::=6             !DATA IN, ALLOW: FORCE TO PAUSE
536             INVALIDATE::=7          !INVALIDATE CACHE  LOCATION FUNCTION
537
538
539
540     .TOC   *       UCON CONTROL
```

```
541
542
543
544     .TOC    *           <FLPGO>-START HOT FLOATING POINT
545     !INITIATES HOT FLOATING POINT FUNCTION.  ONLY USED IF BEGIN/YES & SELECT/UCON.
546     .FIELD FLPGO::=<22>
547             NO::=0                  !NOP
548             YES::=1                 !YELL GO
549
550
551
552     .TOC    *           <UCON-XFER>-UCON OPERATION
553     !EXECUTE A UCON FUNCTION. ONLY USED IF BEGIN/YES & SELECT/UCON.
554     .FIELD UCON-XFER::=<21>
555             NO::=0                  !NOP
556             YES::=1                 !START UCON OPERATION
557
558
559
560     .TOC    *           <UCON-LOAD>-LOAD UCON REGISTER
561     !LOAD UCON CONTROL REGISTER. ONLY USED IF BEGIN/YES & SELECT/UCON.
562     .FIELD UCON-LOAD::=<20>
563             NO::=0                  !NOP
564             YES::=1                 !LOAD UCON CONTROL REGISTER
565
566
567
568     .TOC    *     CSP ADDRESS SPECIFICATION
569
570
571     .TOC    *           <CSPADDR>-CSP IMMEDIATE ADDRESS
572     !SPECIFY CSP 4 BIT ADDRESS. ONLY USED IF BEN/CSP.
573     .FIELD CSPADDR::=<23:20>
574             D00::=17                !NOTE INVERSION
575             D01::=16                !
576             D02::=15                !
577             D03::=14                !
578             D04::=13                !
579             D05::=12                !
580             D06::=11                !
581             D07::=10                !
582             D10::=07                !
583             D11::=06                !
584             D12::=05                !
585             D13::=04                !
586             D14::=03                !
587             D15::=02                !
588             D16::=01                !
589             D17::=00                !
590             C052525::=07            !CSP/DCS CONSTANTS
591             C125252::=06            !
592             C177777::=05            !
593             C000000::=04            !
594
```

```
595
596
597     .TOC    *       SHIFT CONTROL
598
599
600     .TOC    *       <BMUX>-SECOND LEVEL OF SHIFT TREE
601     !BMUX CONTROLS SHIFT RIGHT OF 0 OR 4. ALWAYS IN EFFECT.
602     .FIELD BMUX::=<23>
603             DIRECT::=0                      !AMUX<15:00>
604             RIGHT-4::=1                     !4*D[C] # AMUX <15:04>
605
606
607
608     .TOC    *       <AMUX>-FIRST LEVEL OF SHIFT TREE
609     !AMUX CONTROLS INPUT OF D-REG/COUNTER TO TREE. ALWAYS IN EFFECT.
610     .FIELD AMUX::=<22:20>
611             DIRECT::=0                      !D<HI> # D<LO>
612             D[LO]#D[LO]::=1                 !D<LO> # D<LO>
613             SIGNEXT::=2                     !8*D[C] # D<LO>
614             COUNTER#D[LO]::=3               !COUNTER # D<LO>
615             COUNTER::=3                     !SAME
616             D[HI]#D[HI]::=4                 !D<HI> # D<HI>
617             SWAB::=5                        !D<LO> # D<HI>
618             RIGHT-8::=6                     !8*D[C] # D<HI>
619             COUNTER#D[HI]::=7               !COUNTER # D<HI>
620
621     !-------------------------------------------------------------------------------------------
622
623
624
625     .TOC    *   SP REWRITE & REGISTER CLOCKS
626
627
628
629     .TOC    *       <WRCSP>-WRITE TO CSP
630     !WRITE CSP FROM DMUX [BUSDIN/CACHE]. ALWAYS IN EFFECT.
631     .FIELD WRCSP::=<19>,0
632             NO::=0                          !NOP
633             YES::=1                         !ON P3, 120-150 NS.
634
635
636
637     .TOC    *       <MOD>-MODE CONTROL OF FOLLOWING BITS
638     !CONTROLS REDEFINITION OF SP REWRITE/REGISTER CLOCK BITS. ALWAYS IN EFFECT.
639     .FIELD MOD::=<14>,0
640             CLKSP::=0                       !CONTROL ASP/BSP CLOCKING
641             LOADREG::=1                     !CONTROL RES-REG/COUNTER LOADING
642
643
644
645     .TOC    *       SP REWRITE [A,B] CONTROL
646     !WHEN MOD/CLKSP
647
648
```

```
649     .TOC    *       <HILO>-SP HI/LO SELECT
650     !WHICH HALF OF SP'S TO REWRITE. ONLY IF MOD/CLKSP.
651     .FIELD HILO::=<18>
652             LO::=0                  !REWRITE ENABLE A/B SP LO [00-17]
653               L::=0                 !
654             HI::=1                  !REWRITE ENABLE A/B SP HI [20-37]
655               H::=1                 !
656
657
658
659     .TOC    *       <WRSEL>-REWRITE ADDRESS SELECT
660     !WHICH WRITE ADDRESS TO USE ON REWRITE. ONLY IF MOD/CLKSP.
661     .FIELD WRSEL::=<17>
662             A-ADDR::=0              !USE A ADDRESS ON REWRITE
663               A::=0                 !
664             B-ADDR::=1              !USE B ADDRESS ON REWRITE
665               B::=1
666
667
668
669     .TOC    *       <WRSP>-REWRITE A/B SELECT
670     !ENABLE REWRITE OF SPECIFIC SP'S. ONLY IF MOD/CLKSP.
671     .FIELD WRSP::=<16:15>
672             NOP::=0                 !NO ASP/BSP REWRITE
673             WR-A::=1                !WRITE ASP ONLY, ON P3 120-150 NS.
674               A::=1                 !
675               ASP::=1               !
676             WR-B::=2                !WRITE BSP ONLY, ON P3 120-150 NS.
677               B::=2                 !
678               BSP::=2               !
679             WR-A-AND-B::=3          !WRITE BOTH ON P3
680               AB::=3                !
681               BA::=3                !
682               ABSP::=3              !
683               BASP::=3              !
684               BOTH::=3              !
685
686
687
688     .TOC    *       REGISTER LOADING
689     !WHEN MOD/LOADREG
690
691
692     .TOC    *       <LOADRES>-LOAD RESIDUAL CONTROL REGISTER
693     !ENABLE LOAD OF RESIDUAL CONTROL REGISTER FROM B-BUS. ONLY IF MOD/LOADREG.
694     .FIELD LOADRES::=<18>
695             NO::=0                  !NOP
696             YES::=1                 !LOAD RES WITH B-BUS<14:11>
697                                     !AT P2 T[100 NS], B-BUS<14> COMPLEMENTED
698
699
700
701     .TOC    *       <LOADCOUNT>-LOAD COUNTER
702     !ENABLE LOAD OF COUNTER FROM B-BUS <7:0>. ONLY IF MOD/LOADREG.
```

```
703     .FIELD LOADCOUNT::=<16>
704             NO::=0                          !NOP
705             YES::=1                         !LOAD COUNTER AT P2 T[100 NS].
706
707     !-------------------------------------------------------------------------------
708
709
710
711     .TOC    *   SEQUENCING FIELD
712
713
714
715     .TOC    *       <UBF>-BUT MICROBRANCH FIELD
716     !SPECIFIES CONDITIONS TO MODIFY <UPF>/<J> FIELD DURING BRANCH.  ALWAYS IN EFFECT.
717     .FIELD UBF::=<13:9>,30
718
719     .TOC    *           NO BUT
720             NULL::=30                               !SPECIFY NO MODIFICATION - DEFAULT
721
722     .TOC    *           ACTIVE ONLY
723     !PURELY ACTIVE BUTS GENERATE SIDE AFFECTS; THEY DO NOT MODIFY THE <UPF> FIELD
724     !BY THE "OR-ING"-IN-OF-CONDITIONS METHOD.  THEY MAY MODIFY EXPLICITLY THE ENTIRE <UPF> FIELD,
725     !AS IN BUT(RETURN)
726             R-OR-1::=22                             !FORM R[SF]-IOR-"001
727             CUA-TRACK::=31                          !RESUME/RESTART CUA TRACKING
728             CLR-FLAG-RES-UCON::=32                  !CLEAR FLAGS<2:0>, EX-FLAG<1>, RES-REGISTER, UCON-REGISTER
729             DIAGNOSE::=33                           !SPECIAL DIAGNOSTIC BUT
730             SUBRB::=34                              !RETURN <- EMIT<14:03>, PAGE <- EMIT<02:00>
731               SUBR-B::=34                           !SYNONYMS ARE:
732               GOTO::=34                             !
733               GO-TO::=34                            !
734             SUBRA::=35                              !RETURN <- D<14:03>, PAGE <- EMIT<02:00>
735               SUBR-A::=35                           !SYNONYM
736             B#36::=36                               !TBD
737             RETURN::=37                             !PAGE <- RETURN<11:09>, NUA <- RETURN<08:00>
738
739     .TOC    *           INACTIVE ONLY
740     !INACTIVE BUTS ONLY CAUSE MODIFICATION OF THE <UPF> FIELD BY THE "OR-ING"-
741     !IN-OF-CONDITIONS METHOD.
742                                                     !----UPF MASK-----
743                                                     !876 543 210 OCTAL  *=NOT AFFECTED
744             SR3-0::=00                              !*** **0 000 (000)
745               CASE::=00                             !
746               SR03::=00                             !*** **0 111 (007)
747               SR02::=00                             !*** **1 011 (013)
748               SR01::=00                             !*** **1 101 (015)
749               SR00::=00                             !*** **1 110 (016)
750             IR15-12::=01                            !*** **0 000 (000)
751               DOP::=01                              !
752             INSTR5::=02                             !*** *00 000 (000)
753               INSTR-5::=02                          !
754             IR11#FLTPT3-0::=03                      !*** *00 000 (000)
755               IR11-A::=03                           !*** *01 111 (017)
756             IR9-6::=04                              !*** **0 000 (000)
```

```
757             SOP::=04                        !
758           MOV-DR7*IRS-3::=05                !*** **0 000 (000)
759             MOV-DR7::=05                    !*** **0 111 (007)
760             IRS-3::=05                      !*** **1 000 (010)
761           BGSERV-FPSERV*D[C]*FPRET::=07     !*** **0 000 (000)
762             BGSERV-FPSERV::=07              !*** **0 111 (007)
763             D[C]-C::=07                     !*** **1 011 (013)
764             FPRET1-0::=07                   !*** **1 100 (014)
765           COUT07*DOUT07*FPS05::=10          !*** *** 000 (000)
766             COUT07::=10                     !*** *** 011 (003)
767             DOUT07::=10                     !*** *** 101 (005)
768             COUT07*DOUT07::=10              !*** *** 001 (001)
769             FPS05::=10                      !*** *** 110 (006)
770           DMO*SMO*BYTE::=11                 !*** *** 000 (000)
771             DMO::=11                        !*** *** 011 (003)
772             SMO::=11                        !*** *** 101 (005)
773             BYTE::=11                       !*** *** 110 (006)
774           GD3-2::=12                        !*** *** *00 (000)
775           BG-SERVCE-L*MFSS*MULTIPLE::=14    !*** *** 000 (000)
776             BG-SERVCE-L::=14                !*** *** 011 (003)
777             MFSS::=14                       !*** *** 101 (005)
778             MULTIPLE::=14                   !*** *** 110 (006)
779               MASKED-PS[T]::=14             !
780               DOO::=14                      !
781               PS[N]::=14                    !
782               FLAG7::=14                    !
783               EXFLAG1::=14                  !
784               FLTPTS::=14                   !
785               EXFLAG2::=14                  !
786               INIT-JAM::=14                 !
787           D14-OOEQO*D15::=15                !*** *** *00 (000)
788             D14-OO-EQ-O*D15::=15            !
789             D14-OO-EQ-O::=15                !*** *** *01 (001)
790             D15::=15                        !*** *** *10 (002)
791           IR11*PS15::=16                    !*** *** *00 (000)
792             IR11-8::=16                     !*** *** *01 (001)
793             PS15::=16                       !*** *** *10 (002)
794           VECTOR-LOAD*DR6-7L::=21           !*** *** *00 (000)
795             VECTOR-LOAD::=21                !*** *** *01 (001)
796             DR6-7L::=21                     !*** *** *10 (002)
797           D[C]*BAOO::=23                    !*** *** *00 (000)
798             D[C]-8::=23                     !*** *** *01 (001)
799             BAOO::=23                       !*** *** *10 (002)
800           OTHER-JAM*FP-PROC::=24            !*** *** *00 (000)
801             OTHER-JAM::=24                  !*** *** *01 (001)
802             FP-PROC::=24                    !*** *** *10 (002)
803           INTR-HIGH*INSTR-BRANCH-L::=26     !*** *** *00 (000)
804             INTR-HIGH::=26                  !*** *** *01 (001)
805             INSTR-BRANCH-L::=26             !*** *** *10 (002)
806           PREFETCH-JAM*FP-FD::=27           !*** *** *00 (000)
807             PREFETCH-JAM::=27               !*** *** *01 (001)
808             FP-FD::=27                      !*** *** *10 (002)
809
810     .TOC    *       BOTH ACTIVE AND INACTIVE
```

```
811     !THESE BUTS HAVE BOTH ACTIVE AND INACTIVE EFFECTS
812                                             !----UPF MASK-----
813                                             !876 543 210 OCTAL  *=NOT AFFECTED
814             INSTR1::=06                     !*00 000 000 (000)  BUS CONTROL, SP REWRITE DEFEAT
815               INSTR-1::=06                  !
816             SR1-0#COUNT-IS-377::=13         !*** *** 000 (000)  BUMP COUNTER
817               SR1-0::=13                    !*** *** 001 (001)  STILL BUMP COUNTER
818               COUNT-IS-377-A::=13           !*** *** 110 (006)  BUMP COUNTER
819             COUNT-IS-377#D[C]::=17          !*** *** *00 (000)  BUMP COUNTER
820               COUNT-IS-377-B::=17           !*** *** *01 (001)  BUMP COUNTER
821               D[C]-A::=17                   !*** *** *10 (002)  STILL BUMP COUNTER
822             COUNT-IS-377::=25               !*** *** **0 (000)  BUMP COUNTER
823             PREFETCH-L#SERVICE::=20         !*** *** *00 (000)  TIMING
824               PREFETCH-L::=20               !*** *** *01 (001)  TIMING
825               SERVICE::=20                  !*** *** *10 (002)  TIMING
826               LAST::=20                     !*** *** *11 (003)  TIMING
827
828
829
830
831     .TOC    *     <UPF>-MICRO POINTER FIELD
832     !SPECIFIES EITHER NEXT MICROINSTRUCTION ADDRESS OR BASE TARGET
833     !ADDRESS TO BE USED "UNDER" THE BUT-CODE IN <UBF>.
834     .FIELD          UPF::=<8:0>,000         !ACTUAL MICROWORD POINTER FIELD
835     .ADDRESS        J::=<8:0>               !THIS FIELD ALSO HAS MICROADDRESS QUALITIES
836
837             !BASE MACHINE MICROCODE ENTRY POINTS:
838
839             !THESE ENTRY POINTS HAVE BEEN FIXED AS OF 31-AUGUST-1976.
840             INIT01  ::=  3412       !INITIALIZATION SUBROUTINE
841             CON99   ::=  1040       !FORCE "CONSOLE-MODE HALT"
842             FET01   ::=  0702       !INSTR FETCH, NO OVERLAP
843             FET03   ::=  0700       !INSTR FETCH, OVERLAP
844             SER01   ::=  0701       !SERVICE ENTRY, OVERLAP
845             SER02   ::=  0703       !SERVICE ENTRY, NO OVERLAP
846
847             !ENTRY POINTS INTO BASE MACHINE FOR "BUTA(DIAGNOSE)":
848             !THESE ENTRY POINTS FIXED AS OF 26-OCT-76:
849             MED23   ::=  3200       !FOR FLPADR:  D←ASPLO[DF]-TOP
850             MED25   ::=  3020       !FOR FLPADR:  D←ASPHI[DF]-TOP
851             MED27   ::=  3210       !FOR FLPADR:  ASPLO[DF]-TOP←D
852             MED29   ::=  3214       !FOR FLPADR:  ASPHI[DF]-TOP←D
853             MED31   ::=  3044       !FOR FLPADR:  D←BSPLO[DF]-TOP
854             MED33   ::=  3230       !FOR FLPADR:  D←BSPHI[DF]-TOP
855             MED35   ::=  3234       !FOR FLPADR:  BSPLO[DF]-TOP←D
856             MED37   ::=  3064       !FOR FLPADR:  BSPHI[DF]-TOP←D
857
858             BYTE01  ::=  0032       !FOR KJENAB:  DATOB*KJENAB
859
860             RTS02   ::=  4034       !FOR SPBYKT:  DATI, BA←SP-A, SP←SP+2
861
862             DST01   ::=  0511       !FOR ALTER:   DATIB[P]
863             DST02   ::=  0512       !
864             DST20   ::=  0527       !
```

```
865             DST22   ::=  0525       !
866
867             LOADNZW4 ::= 4330       !FOR FPSCC#CLKFPSCC:  D←CSP(MD)
868             LOADNZW5 ::= 4332       !                     FPS<3:0>←D<3:0>
869
870     !-----------------------------------------------------------------------------------------
871
872
873
874     .TOC    *    MISCELLANEOUS FIELDS
875
876
877
878     .TOC    *       <NEXT-PAGE>-NEW PAGE ADDRESS LOADED DURING BUT[SUBROUTINE]
879     !THESE 3 BITS ARE CLOCKED INTO PAGE REGISTER DURING A BUT[SUBRA] OR
880     !BUT[SUBRB].  ONLY USED WHEN UBF/BUT[SUBRA] OR UBF/BUT[SUBRB].
881     .FIELD NEXT-PAGE::=<32:30>
882
883
884     .TOC    *       <MULTIPLE>-SELECT CODE FOR BUT[MULTIPLE]
885     !MUST BE SET IN BOTH PREVIOUS AND CURRENT MICROWORDS WHEN BUT[MULTIPLE] IS TO BE EMPLOYED.
886     .FIELD MULTIPLE::=<32:30>
887             MASKED-PS[T]::=0        !
888             DOO::=1                 !
889             PS[N]::=2               !
890             FLAG7::=3               !
891             EXFLAG1::=4             !
892             FLTPTS::=5              !
893             EXFLAG2::=6             !
894             INIT-JAM::=7            !
895
896
897
898     .TOC    *       EMIT FIELD - IMMEDIATE DATA FROM MICROWORD
899     !USED WHENEVER LOADING IMMEDIATE DATA FROM MICROWORD
900     .FIELD EMIT::=<47:44>'<41:30>
901     .FIELD EMITH::=<47:44>
902     .FIELD EMITM::=<41:38>
903     .FIELD EMITL::=<37:30>
904     .FIELD EMITML::=<41:30>
905     .FIELD EMIT9-6::=<39:36>
906     .FIELD EMIT15::=<47>
907     .FIELD EMIT14::=<46>
908     .FIELD EMIT13::=<45>
909     .FIELD EMIT12::=<44>
910     .FIELD EMIT11::=<41>
911     .FIELD EMIT10::=<40>
912     .FIELD EMIT09::=<39>
913     .FIELD EMIT08::=<38>
914     .FIELD EMIT07::=<37>
915     .FIELD EMIT06::=<36>
916     .FIELD EMIT05::=<35>
917     .FIELD EMIT04::=<34>
918     .FIELD EMIT03::=<33>
```

```
919     .FIELD EMIT02::=<32>
920     .FIELD EMIT01::=<31>
921     .FIELD EMIT00::=<30>
922
923
924
925     .TOC    *       RETURN ADDRESS - FOR MICROSUBROUTINE CALLS
926     !USED WITH BUT[SUBRB] AND BUT[SUBRA]
927     .FIELD RETURN::=<46:44>'<41:33>          !PAGE # D.I.P.
928
929
930
931     .TOC    *       UCON SELECTION AND CONTROL FIELDS
932
933
934     .TOC    *               SELECTION
935     !SELECT PARTICULAR UCON. ONLY USED IF BEGIN/YES & SELECT/UCON.
936     !FIELD UCON-SEL-EMIT::=<43>              !SELECT EMIT CAN ONLY BE DONE BY USING
937     !       NO::=0                           !  BUTA(CLR-FLAG-RES-UCON) TO ASSERT UCON-SEL-EMIT-L
938     !       YES::=1                          !
939     .FIELD UCON-SEL-I-O::=<46>               !SELECT I-O [BUS] CONTROL
940             NO::=0
941             YES::=1
942     .FIELD UCON-SEL-WCS::=<45>               !SELECT WCS/ECS/DCS
943             NO::=0
944             YES::=1
945     .FIELD UCON-SEL-CACHEKT::=<44>           !SELECT CACHE/KT
946             NO::=0
947             YES::=1
948     .FIELD UCON-SEL-PROC::=<36>              !SELECT PROCESSOR CONTROL
949             NO::=0
950             YES::=1
951     .FIELD UCON-SEL-FLTPT::=<33>             !SELECT HOT FLOATING POINT
952             NO::=0
953             YES::=1
954
955
956
957     .TOC    *               CONTROL
958     !AFTER UCON[S] SELECTED FROM ABOVE, CONTROL COMES FROM HERE.
959     .FIELD UCON::=<32:30>'<35:34>'<47>'<42:38>
960     .FIELD UCONH::=<32:30>
961     .FIELD UCONM::=<35:34>
962     .FIELD UCONL::=<47>'<42:38>
963     .FIELD UCON15::=<32>
964     .FIELD UCON14::=<31>
965     .FIELD UCON13::=<30>
966     .FIELD UCON12::=<35>
967     .FIELD UCON11::=<34>
968     .FIELD UCON10::=<47>
969     .FIELD UCON09::=<42>
970     .FIELD UCON08::=<41>
971     .FIELD UCON07::=<40>
972     .FIELD UCON06::=<39>
```

```
973     .FIELD UCONO5::=<38>
974
975     !-------------------------------------------------------------------------------
976
977
978
979     .TOC   *   BASE MACHINE EXTENSION BITS
980     !
981     !       LAYOUT IN BASE MACHINE [NOT DCS] ADDRESS SPACE:
982     !
983     !                              ------------- PAGE -------------
984     !       --- NAME ---      0        1        2        3        4
985     !       ROMEX 00 H     X                                      X
986     !       ROMEX 01 H                       X        X
987     !       ROMEX 03 H                                X
988     !
989     !       FPSEL L        X                 X                    X
990     !       SFCC L         X                 X                    X
991     !       FLPADR L       X                 X        X           X
992     !
993     !       SPBYKT L       X                                      X
994     !       UDAD01 L       X                                      X
995     !       UDAD00 L       X                                      X
996     !       UKJCONT L      X                                      X
997     !       UKT01 H        X                                      X
998     !       UKT00 H        X                                      X
999     !       UALTER L       X                                      X
1000    !       UKTEN L        X                                      X
1001    !
1002    !
1003    !       NULL BIT DEFINITIONS:
1004    !
1005    .FIELD ROMEX00::=<60>          !ACTIVE HIGH
1006           ZERO::=0                !
1007           ONE::=1                 !
1008    .FIELD ROMEX01::=<61>          !ACTIVE HIGH
1009           ZERO::=0                !
1010           ONE::=1                 !
1011    .FIELD ROMEX03::=<62>          !ACTIVE HIGH
1012           ZERO::=0                !
1013           ONE::=1                 !
1014    .FIELD FPSEL::=<57>            !ACTIVE LOW
1015           ZERO::=1                !
1016           ONE::=0                 !
1017    .FIELD SFCC::=<58>             !ACTIVE LOW
1018           ZERO::=1                !
1019           ONE::=0                 !
1020    .FIELD FLPADR::=<59>           !ACTIVE LOW
1021           ZERO::=1                !
1022           ONE::=0                 !
1023    .FIELD SPBYKT::=<55>           !ACTIVE LOW
1024           ZERO::=1                !
1025           ONE::=0                 !
1026    .FIELD UDAD01::=<53>           !ACTIVE LOW
```

```
1027            ZERO::=1                        !
1028            ONE::=0                         !
1029    .FIELD UDA000::=<52>                    !ACTIVE LOW
1030            ZERO::=1                        !
1031            ONE::=0                         !
1032    .FIELD UKJCONT::=<54>                   !ACTIVE LOW
1033            ZERO::=1                        !
1034            ONE::=0                         !
1035    .FIELD UKT01::=<49>                     !ACTIVE HIGH
1036            ZERO::=0                        !
1037            ONE::=1                         !
1038    .FIELD UKT00::=<48>                     !ACTIVE HIGH
1039            ZERO::=0                        !
1040            ONE::=1                         !
1041    .FIELD UALTER::=<51>                    !ACTIVE LOW
1042            ZERO::=1                        !
1043            ONE::=0                         !
1044    .FIELD UKTEN::=<50>                     !ACTIVE LOW
1045            ZERO::=1                        !
1046            ONE::=0                         !
1047
1048    !-----------------------------------------------------------------------------------------
1049
1050
1051
1052    .TOC    *   SPECIAL DCS FIELDS
1053
1054
1055
1056    .TOC    *     FIELDS USED IN PAGES 4, 5, OR 6 OF DCS
1057
1058
1059    .TOC    *       <LOAD-DCS-CTR>-LOAD DIAGNOSTIC COUNTER FROM EMITH
1060    !THIS CODE LOADS THE 4-BIT DCS COUNTER FROM THE CURRENT
1061    !MICROWORD'S EMITH FIELD.  THIS COUNTER IS CLOCKED AT EVERY PO
1062    !FOLLOWING, UNTIL THE COUNTER REACHES ZERO.  AT THIS POINT, THE
1063    !COMPARE IS ENABLED, CLOCKING THE RESULT OF THE CURRENT ENUA:TNUA
1064    !COMPARE INTO THE ERROR LATCH.
1065    !ONLY USED IN PAGES 4, 5, OR 6 OF DCS.
1066    .FIELD LOAD-DCS-CTR::=<51>,0
1067            NOP::=0                         !NOP
1068            YES::=1                         !LOAD, COUNT, AND ENABLE COMPARE
1069
1070
1071
1072    .TOC    *       <CTR>-4 BIT DCS COUNTER VALUE FROM EMIT
1073    !THIS FOUR BIT VALUE IS LOADED INTO THE COUNTER [DIAGNOSTIC!],
1074    !WHEN LOAD COUNTDOWN/YES.  COMPLEMENT OF ACTUAL VALUE IS USED, FOR COUNT DOWN.
1075    !LOADING COUNTER VALUE OF 17(8) CAUSES COMPARE AT END OF THIS UWORD.
1076    .FIELD CTR::=<47:44>
1077            C0.::=17
1078            C1.::=16
1079            C2.::=15
1080            C3.::=14
```

```
1081            C4.::=13
1082            C5.::=12
1083            C6.::=11
1084            C7.::=10
1085            C8.::=07
1086            C9.::=06
1087            C10.::=05
1088            C11.::=04
1089            C12.::=03
1090            C13.::=02
1091            C14.::=01
1092            C15.::=00
1093
1094
1095
1096    .TOC    *       <LOAD-ENUA-ERRCOD>-LOAD THE ENUA AND ERRCOD REGISTERS
1097    !THIS CODE LOADS THE 12-BIT ENUA REGISTER FROM THE <EMITM,EMITL> FIELD
1098    !OF THE CURRENT MICROWORD, AND LATCHES THE NUA INTO THE ERRCOD REGISTER.
1099    !ONLY USED IN PAGES 4, 5, OR 6 OF DCS.
1100    .FIELD LOAD-ENUA-ERRCOD::=<54>,0
1101            NOP::=0                         !NOP
1102            YES::=1                         !LOAD REGISTERS AT PO
1103
1104
1105
1106    .TOC    *       <ENUA>-ENUA VALUE FROM EMIT
1107    !THIS 12 BIT FIELD IS LOADED FROM <EMIT> TO THE ENUA REGISTER
1108    !WHEN LOAD ENUA-ERRCOD/YES.
1109    .FIELD ENUA::=<41:30>
1110
1111
1112
1113    .TOC    *       <VERIFY>-VERIFY BIT FOR SELF CHECK TEST
1114    !WHEN IN SELF TEST MODE OF DCS, SETTING THIS BIT CAUSES THE VERIFY COUNTER TO BE
1115    !BUMPED AT THE START OF THIS MICROWORD.  THE VERIFY BIT IS IMPLICITLY SET FOR
1116    !ANY REFERENCE TO PAGE 7 [IE, THE COUNTER IS AUTOMATICALLY BUMPED ON A REFERENCE
1117    !TO PAGE 7].
1118    !ONLY [EXPLICITLY] USED IN PAGES 4, 5, OR 6 OF DCS, WHEN IN SELF TEST MODE.
1119    .FIELD VERIFY::=<48>,0
1120            NOP::=0                         !NO ACTION
1121            BUMP::=1                        !BUMP VERIFY COUNTER AT PO, WHEN IN SELF TEST MODE
1122
1123
1124
1125    .TOC    *       FIELDS USED IN PAGE 7 OF DCS EXTENSION
1126
1127
1128    .TOC    *       <EOP>-SIGNAL SUCCESSFUL END OF PASS
1129    !THIS CODE SETS THE END OF PASS LATCH, LIGHTING THE EOP LED
1130    !ONLY USED IN PAGE 7 OF DCS.
1131    .FIELD EOP::=<49>,0
1132            NO::=0                          !NO EOP
1133            SIGNAL::=1                      !SIGNAL SUCCESSFUL EOP AT PO
1134
```

```
1135
1136
1137    .TOC    *       <DAD>-DCS CONTROL OF BASE MACHINE EXTENSION DAD BITS
1138    !THESE BITS ARE WIRE-ANDED INTO THE BASE MACHINE DAD<1:0> BITS.
1139    !MUST BE SPECIFIED IN UWORD BEFORE CSP REFERENCE.
1140    !ONLY USED IN PAGE 7 OF DCS.
1141    .FIELD DAD::=<53:52>,0
1142            NO-DAD::=0                      !
1143            FIRST-1-OR-2::=1                !SETUP BYTE-CONST ROM INPUT
1144            SECOND-1-OR-2::=2               !
1145            WRITE-BYTE::=3                  !SETUP FOR BYTE WRITE TO ASP/BSP
1146
1147
1148
1149    .TOC    *     FIELDS USED IN ALL PAGES OF DCS EXTENSION
1150
1151
1152    .TOC    *       <SCOPE>-SCOPE ON ERROR, DIAGNOSTIC BUT
1153    !THIS CODE IS A SPECIAL BUT, THAT, WHEN ENABLED, CHECKS THE ERROR
1154    !LATCH TO SEE IF IT IS SET.  IF IT IS, NUADD IS FORCED TO A ZERO!
1155    !ELSE IT IS LEFT UNCHANGED.  USED TO IMPLEMENT FORCED SCOPE LOOP ON ERROR.
1156    !USED IN ALL PAGES OF DCS.
1157    .FIELD SCOPE::=<50>,0
1158            NOP::=0                         !NOP
1159            ENABLED::=1                     !ENABLE SCOPE LOOPING FACILITY
1160
1161
1162    !-------------------------------------------------------------------------------
1163    !END OF MICROWORD FIELD DEFINITIONS
1164    !-------------------------------------------------------------------------------
1165
1166
1167
1168    !.PAGE=============================================================================================================
1169
1170    .TOC    * MACRO DEFINITIONS
1171
1172
1173    .TOC    *   PRIMITIVE OPERATIONS
1174
1175
1176    .TOC    *     TIMING
1177    .MACRO P0       ::=  NULL       !0 NS., UP3 VIEWED AS THE START OF A MICROCYCLE
1178
1179    .MACRO P1       ::=  NULL       !60 NS., AT P1
1180    .MACRO P1-L     ::=  NULL       !30 NS., AT P1 LEADING EDGE
1181    .MACRO P1-T     ::=  NULL       !60 NS., AT P1 TRAILING EDGE
1182
1183    .MACRO P2       ::=  NULL       !100 NS., AT P2
1184    .MACRO P2-L     ::=  NULL       !70 NS., AT P2 LEADING EDGE
1185    .MACRO P2-T     ::=  WHEN/AT-P2-T  !100 NS., AT P2 TRAILING EDGE
1186    .MACRO P2-U     ::=  NULL       !UNSUPPRESSED P2, CLOCK CONTINUOUSLY
1187
1188    .MACRO P3       ::=  NULL       !150 NS., 120-150 NS., AT P3
```

```
1189    .MACRO P3-L     ::=  NULL        !120 NS., AT P3 LEADING EDGE
1190    .MACRO P3-T     ::=  WHEN/AT-P3-T  !150 NS., AT P3 TRAILING EDGE
1191    .MACRO P3-U     ::=  NULL        !UNSUPPRESSED P3, CLOCK CONTINUOUSLY
1192
1193    .MACRO UP3      ::=  NULL        !P3 DELAYED BY 5 NS., PO VIEWED AS THE END OF A
1194                                     !MICROCYCLE. LATCHES NEW MICROINSTRUCTION INTO
1195                                     !THE MICROWORD BUFFER REGISTER.
1196
1197    .MACRO DEFER    ::=  NULL        !CONTROL IS ISSUED AT THIS TIME,
1198                                     !   ANY REQUIRED CLOCKING OCCURS LATER
1199    .MACRO NEXT     ::=  NULL        !WHERE TO GO NEXT, CLOCKED AT UP3
1200    .MACRO SETUP    ::=  NULL        !SETUP DATA/CONTROL
1201    .MACRO SELECT   ::=  NULL        !MAKE A HOT-BOX SELECTION
1202    .MACRO ISSUE    ::=  NULL        !SET/CLEAR HOT-BOX FLAG
1203    .MACRO ENABLE   ::=  NULL        !   DITTO
1204    .MACRO EMITC    ::=  NULL        !SPECIFY AN EMIT-CONSTANT VALUE
1205
1206
1207
1208    !.PAGE=============================================================================================================
1209
1210    .TOC   *     WRITING THE A AND B SCRATCH PADS
1211    !
1212    !  WRITING THE APPROPRIATE SCRATCH PADS:
1213    !
1214    !                                        (NOP       )
1215    !                                        (A   L     A)
1216    !                                     WR (B , H   , B)
1217    !                                        (AB        )
1218    !                                       /!\  /!\  /!\
1219    !                                       !    !    !
1220    !       ASP, BSP, BOTH, NEITHER---------     !    !
1221    !       LO[00-17], OR HI[20-37]--------------     !
1222    !       USE "A" SIDE OR "B" SIDE ADDRESS----------
1223    !
1224    !  WRITES CONTENTS OF D-REGISTER INTO ADDRESSED SCRATCH PADS [SEE
1225    !      BELOW] DURING P3
1226    !
1227    .MACRO WR(AB,HL,ADDR)  ::=  MOD/CLKSP,          !CLOCK SP MODE
1228                                WRSP/@AB,           !NOP, A, ASP, B, BSP, AB, ABSP, BA, BASP, BOTH ARE CHOICES
1229                                HILO/@HL,           !HI, LO, H, L ARE CHOICES
1230                                WRSEL/@ADDR         !A, B, A-ADDR, B-ADDR ARE CHOICES
1231
1232
1233
1234    .TOC   *     ASP AND BSP PHYSICAL REGISTER ADDRESSES
1235    !
1236    !  ENABLE INPUT/OUTPUT [FOR READ AND/OR WRITE] OF THE APPROPRIATE SCRATCH PAD ONTO
1237    !  EITHER BUS-A OR BUS-B VIA EXACT PHYSICAL ADDRESS
1238    !
1239    .MACRO ASPLO(XX)       ::=  AEN/ASPLO,          !SELECT
1240                                ASEL/@XX,           !REGISTER &
1241                                RIF/@XX             !ENABLE ON BUS-A
1242
```

```
1243    .MACRO ASPHI(XX)        ::=  AEN/ASPHI,          !SELECT
1244                                    ASEL/@XX,        !REGISTER &
1245                                    RIF/@XX          !ENABLE ON BUS-A
1246
1247    .MACRO ASP(XX)          ::=  ASEL/@XX,           !SELECT REGISTER,
1248                                    RIF/@XX          !NO ENABLE
1249
1250
1251    .MACRO BSPLO(XX)        ::=  BEN/BSPLO,          !SELECT
1252                                    BSEL/@XX,        !REGISTER &
1253                                    RIF/@XX          !ENABLE ON BUS-B
1254
1255    .MACRO BSPHI(XX)        ::=  BEN/BSPHI,          !SELECT
1256                                    BSEL/@XX,        !REGISTER &
1257                                    RIF/@XX          !ENABLE ON BUS-B
1258
1259    .MACRO BSP(XX)          ::=  BSEL/@XX,           !SELECT REGISTER,
1260                                    RIF/@XX          !NO ENABLE
1261
1262
1263
1264
1265
1266    .TOC    *     ASP AND BSP BASE MACHINE FUNCTIONAL REGISTER ADDRESSES
1267    !
1268    !  ENABLE INPUT/OUTPUT [FOR READ AND/OR WRITE] OF THE APPROPRIATE SCRATCH PAD ONTO
1269    !  EITHER BUS-A "-A" OR BUS-B "-B" VIA FUNCTIONAL REGISTER DESIGNATION
1270    !
1271    .MACRO R0-A             ::=  ASPLO(R00)
1272    .MACRO R0-B             ::=  BSPLO(R00)
1273    .MACRO R1-A             ::=  ASPLO(R01)
1274    .MACRO R1-B             ::=  BSPLO(R01)
1275    .MACRO R2-A             ::=  ASPLO(R02)
1276    .MACRO R2-B             ::=  BSPLO(R02)
1277    .MACRO R3-A             ::=  ASPLO(R03)
1278    .MACRO R3-B             ::=  BSPLO(R03)
1279    .MACRO R4-A             ::=  ASPLO(R04)
1280    .MACRO R4-B             ::=  BSPLO(R04)
1281    .MACRO R5-A             ::=  ASPLO(R05)
1282    .MACRO R5-B             ::=  BSPLO(R05)
1283    .MACRO SP-A             ::=  ASPLO(R06)
1284    .MACRO SP-B             ::=  BSPLO(R06)
1285    .MACRO PC-A             ::=  ASPLO(R07)
1286    .MACRO PC-B             ::=  BSPLO(R07)
1287    .MACRO FACA[0]-B        ::=  BSPHI(R10)
1288    .MACRO FACB[0]-A        ::=  ASPHI(R10)
1289    .MACRO FACC[0]-B        ::=  BSPLO(R10)
1290    .MACRO FACD[0]-A        ::=  ASPLO(R10)
1291    .MACRO FACA[1]-B        ::=  BSPHI(R11)
1292    .MACRO FACB[1]-A        ::=  ASPHI(R11)
1293    .MACRO FACC[1]-B        ::=  BSPLO(R11)
1294    .MACRO FACD[1]-A        ::=  ASPLO(R11)
1295    .MACRO FACA[2]-B        ::=  BSPHI(R12)
1296    .MACRO FACB[2]-A        ::=  ASPHI(R12)
```

```
1297    .MACRO FACC[2]-B        ::=  BSPLO(R12)
1298    .MACRO FACD[2]-A        ::=  ASPLO(R12)
1299    .MACRO FACA[3]-B        ::=  BSPHI(R13)
1300    .MACRO FACB[3]-A        ::=  ASPHI(R13)
1301    .MACRO FACC[3]-B        ::=  BSPLO(R13)
1302    .MACRO FACD[3]-A        ::=  ASPLO(R13)
1303    .MACRO FACA[4]-B        ::=  BSPHI(R14)
1304    .MACRO FACB[4]-A        ::=  ASPHI(R14)
1305    .MACRO FACC[4]-B        ::=  BSPLO(R14)
1306    .MACRO FACD[4]-A        ::=  ASPLO(R14)
1307    .MACRO FACA[5]-B        ::=  BSPHI(R15)
1308    .MACRO FACB[5]-A        ::=  ASPHI(R15)
1309    .MACRO FACC[5]-B        ::=  BSPLO(R15)
1310    .MACRO FACD[5]-A        ::=  ASPLO(R15)
1311    .MACRO FDSTA-B          ::=  BSPHI(R17)
1312    .MACRO FDSTB-A          ::=  ASPHI(R17)
1313    .MACRO FDSTC-B          ::=  BSPLO(R17)
1314    .MACRO FDSTD-A          ::=  ASPLO(R17)
1315    .MACRO FPSHI#FEC-A      ::=  ASPHI(R16)
1316    .MACRO FEA-B            ::=  BSPHI(R16)
1317    .MACRO USER-SP-A        ::=  ASPLO(R16)
1318    .MACRO USER-SP-B        ::=  BSPLO(R16)
1319    .MACRO WHAMI-A          ::=  ASPHI(R02)
1320    .MACRO R[ZERO]-B        ::=  BSPHI(R03)
1321    .MACRO R[IR]-A          ::=  ASPHI(R17)
1322    .MACRO R[SRC]-B         ::=  BSPHI(R04)
1323    .MACRO R[SRC]-A         ::=  ASPHI(R04)
1324    .MACRO R[DST]-B         ::=  BSPHI(R05)
1325    .MACRO R[DST]-A         ::=  ASPHI(R05)
1326    .MACRO R[VECT]-B        ::=  BSPHI(R02)
1327    .MACRO WCSB[0]-B        ::=  BSPHI(R00)
1328    .MACRO WCSB[1]-B        ::=  BSPHI(R01)
1329    .MACRO WCSA[0]-A        ::=  ASPHI(R00)
1330    .MACRO WCSA[1]-A        ::=  ASPHI(R01)
1331    .MACRO FPA-B            ::=  BSPHI(R06)
1332    .MACRO CNSL-CNTL-B      ::=  BSPHI(R07)
1333    .MACRO CNSL-CADR-A      ::=  ASPHI(R07)
1334    .MACRO CNSL-SW-A        ::=  ASPHI(R06)
1335    .MACRO CNSL-TMPSW-A     ::=  ASPHI(R03)
1336
1337
1338
1339    .TOC   *     ASP AND BSP INDIRECT REGISTER ADDRESSES
1340    !
1341    !  ENABLE INPUT/OUTPUT [FOR READ AND/OR WRITE] OF THE APPROPRIATE SCRATCH PAD
1342    !  ON BUS-A [A] OR BUS-B [B] USING INDIRECT ADDRESSING WITH THE IR,
1343    !  WHERE:
1344    !
1345    !      SF<3:0>H = [FLPADR H + KTSRCADRS3 H] # [FLTPT L * IR8 H] # [IR7 H] # [IR6 H + ROR1 H]
1346    !
1347    !      DF<3:0>H = [FLPADR H + KTDSTADRS3 H] # [IR2 H] # [IR1 H] # [IR0 H]
1348    !
1349    .MACRO R[SF]-LO-A       ::=  AEN/ASPLO,ASEL/SF
1350    .MACRO R[SF]-LO-B       ::=  BEN/BSPLO,BSEL/SF
```

```
1351    .MACRO R[SF]-HI-A       ::=  AEN/ASPHI,ASEL/SF
1352    .MACRO R[SF]-HI-B       ::=  BEN/BSPHI,BSEL/SF
1353    .MACRO R[DF]-LO-A       ::=  AEN/ASPLO,ASEL/DF
1354    .MACRO R[DF]-LO-B       ::=  BEN/BSPLO,BSEL/DF
1355    .MACRO R[DF]-HI-A       ::=  AEN/ASPHI,ASEL/DF
1356    .MACRO R[DF]-HI-B       ::=  BEN/BSPHI,BSEL/DF
1357    .MACRO R[SF]-A          ::=  R[SF]-LO-A
1358    .MACRO R[SF]-B          ::=  R[SF]-LO-B
1359    .MACRO R[DF]-A          ::=  R[DF]-LO-A
1360    .MACRO R[DF]-B          ::=  R[DF]-LO-B
1361
1362
1363
1364    .TOC   *     ASP, BSP INDIRECT ADDRESSING
1365    !
1366    !      THESE MACROS ONLY SELECT THE ADDRESS MODE FOR THE ASP AND BSP;
1367    !      THE SELECTED SP IS NOT ENABLED ONTO THE BUS
1368    !
1369    .MACRO ASP-ADDRS-R[DF] ::=  ASEL/DF
1370    .MACRO ASP-ADDRS-R[SF] ::=  ASEL/SF
1371    .MACRO BSP-ADDRS-R[DF] ::=  BSEL/DF
1372    .MACRO BSP-ADDRS-R[SF] ::=  BSEL/SF
1373
1374
1375
1376
1377    .TOC   *     ASP AND BSP DCS SPECIFIC FUNCTIONAL REGISTER ADDRESSES
1378    !
1379    !  ENABLE INPUT/OUTPUT [FOR READ AND/OR WRITE] OF THE APPROPRIATE SCRATCH PAD ONTO
1380    !  EITHER BUS-A "-A" OR BUS-B "-B" VIA FUNCTIONAL REGISTER DESIGNATION
1381    !
1382    .MACRO C000000-A        ::=  ASPHI(C000000)     !IN R01
1383    .MACRO C000000-B        ::=  BSPHI(C000000)     !IN R01
1384    .MACRO C177777-A        ::=  ASPHI(C177777)     !IN R03
1385    .MACRO C177777-B        ::=  BSPHI(C177777)     !IN R03
1386    .MACRO C125252-A        ::=  ASPHI(C125252)     !IN R05
1387    .MACRO C125252-B        ::=  BSPHI(C125252)     !IN R05
1388    .MACRO C052525-A        ::=  ASPHI(C052525)     !IN R07
1389    .MACRO C052525-B        ::=  BSPHI(C052525)     !IN R07
1390    .MACRO C000001-A        ::=  ASPHI(C000001)     !IN R11
1391    .MACRO C000001-B        ::=  BSPHI(C000001)     !IN R11
1392    .MACRO C100000-A        ::=  ASPHI(C100000)     !IN R13
1393    .MACRO C100000-B        ::=  BSPHI(C100000)     !IN R13
1394    .MACRO C000200-A        ::=  ASPHI(C000200)     !IN R15
1395    .MACRO C000200-B        ::=  BSPHI(C000200)     !IN R15
1396
1397
1398
1399    !.PAGE=============================================================================================================
1400
1401    .TOC   *     WRITING THE C SCRATCH PAD
1402    !
1403    !  WRITE DATA ON BUSDIN [ACTUALLY DMUX OUTPUT] INTO ADDRESSED CSP LOCATION
1404    !      [SEE BELOW] DURING P3
```

```
1405    !
1406    .MACRO WR-CSP           ::=  WRCSP/YES
1407
1408
1409
1410    .TOC   *     CSP IMPLIED ADDRESSING
1411    !
1412    !  ENABLE FOR INPUT/OUTPUT [READ AND/OR WRITE] ONTO BUS-B ONLY A SPECIFIC CSP LOCATION,
1413    !  WHERE THE ADDRESS IS DETERMINED AS FOLLOWS:
1414    !
1415    !       CSPADDR<3:0>H = -[ 0 # 0 # BSEL<1>H # BSEL<0>H ]
1416    !
1417    .MACRO CSPB(XX)         ::=  BEN/BASCON,          !USE IMMEDIATE MODE
1418                                 BSEL/@XX             !WHICH ONE
1419
1420
1421
1422    .TOC   *     CSP DIRECT ADDRESSING
1423    !
1424    !  ENABLE FOR INPUT/OUTPUT [READ AND/OR WRITE] ONTO BUS-B ONLY A SPECIFIC CSP LOCATION,
1425    !  WHERE THE ADDRESS IS DETERMINED AS FOLLOWS:
1426    !
1427    !       CSPADDR<3:0>H = -UWORD<23:20> H
1428    !
1429    .MACRO CSPD(XX)         ::=  BEN/CSP,             !USE CSP-ADDR MODE
1430                                 CSPADDR/@XX          !WHICH ONE
1431
1432
1433
1434    !.PAGE=============================================================================================================
1435
1436    .TOC   *     SHIFT TREE SPECIFICATION
1437    !N.B. MAY REQUIRE PRIOR SETUP OF RES-REGISTER FOR SHIFT END MUX SELECTION CONTROL
1438    !  (EG, WHEN ASEL/LEFT-1 IS USED).
1439
1440    .TOC   *       ENABLED ONTO BUS A
1441    .MACRO D-RIGHT-14               ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/RIGHT-4,ASEL/RIGHT-2
1442    .MACRO D-RIGHT-13               ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/RIGHT-4,ASEL/RIGHT-1
1443    .MACRO D-RIGHT-12               ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/RIGHT-4,ASEL/DIRECT
1444    .MACRO D-RIGHT-11               ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/RIGHT-4,ASEL/LEFT-1     !SENDMUX SETUP
1445    .MACRO D-RIGHT-10               ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/DIRECT,ASEL/RIGHT-2
1446    .MACRO D-RIGHT-9                ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/DIRECT,ASEL/RIGHT-1
1447    .MACRO D-RIGHT-8                ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/DIRECT,ASEL/DIRECT
1448    .MACRO D-RIGHT-7                ::=  AEN/CMUX,AMUX/RIGHT-8,BMUX/DIRECT,ASEL/LEFT-1      !SENDMUX SETUP
1449    .MACRO D-RIGHT-6                ::=  AEN/CMUX,AMUX/DIRECT,BMUX/RIGHT-4,ASEL/RIGHT-2
1450    .MACRO D-RIGHT-5                ::=  AEN/CMUX,AMUX/DIRECT,BMUX/RIGHT-4,ASEL/RIGHT-1
1451    .MACRO D-RIGHT-4                ::=  AEN/CMUX,AMUX/DIRECT,BMUX/RIGHT-4,ASEL/DIRECT
1452    .MACRO D-RIGHT-3                ::=  AEN/CMUX,AMUX/DIRECT,BMUX/RIGHT-4,ASEL/LEFT-1      !SENDMUX SETUP
1453    .MACRO D-RIGHT-2                ::=  AEN/CMUX,AMUX/DIRECT,BMUX/DIRECT,ASEL/RIGHT-2
1454    .MACRO D-RIGHT-1                ::=  AEN/CMUX,AMUX/DIRECT,BMUX/DIRECT,ASEL/RIGHT-1
1455    .MACRO D-NO-SHIFT               ::=  AEN/CMUX,AMUX/DIRECT,BMUX/DIRECT,ASEL/DIRECT
1456    .MACRO D-DIRECT                 ::=  D-NO-SHIFT
1457    .MACRO D-LEFT-1                 ::=  AEN/CMUX,AMUX/DIRECT,BMUX/DIRECT,ASEL/LEFT-1       !SENDMUX SETUP
1458    .MACRO D-SWAB                   ::=  AEN/CMUX,AMUX/SWAB,BMUX/DIRECT,ASEL/DIRECT
```

```
1459    .MACRO D-SWAB-RIGHT-3           ::=  AEN/CMUX,AMUX/SWAB,BMUX/RIGHT-4,ASEL/LEFT-1        !SENDMUX SETUP
1460    .MACRO D-SWAB-LEFT-1            ::=  AEN/CMUX,AMUX/SWAB,BMUX/DIRECT,ASEL/LEFT-1         !SENDMUX SETUP
1461    .MACRO D-SIGNEXT                ::=  AEN/CMUX,AMUX/SIGNEXT,BMUX/DIRECT,ASEL/DIRECT
1462    .MACRO D-SIGNEXT-RIGHT-1        ::=  AEN/CMUX,AMUX/SIGNEXT,BMUX/DIRECT,ASEL/RIGHT-1
1463    .MACRO D-SIGNEXT-LEFT-1         ::=  AEN/CMUX,AMUX/SIGNEXT,BMUX/DIRECT,ASEL/LEFT-1      !SENDMUX SETUP
1464    .MACRO NO-SHIFT                 ::=  AEN/CMUX,BMUX/DIRECT,ASEL/DIRECT
1465    .MACRO DIRECT                   ::=  NO-SHIFT
1466    .MACRO COUNT#D[HI]              ::=  AEN/CMUX,AMUX/COUNTER#D[HI],BMUX/DIRECT,ASEL/DIRECT
1467    .MACRO COUNT#D[LO]              ::=  AEN/CMUX,AMUX/COUNTER#D[LO],BMUX/DIRECT,ASEL/DIRECT
1468
1469
1470
1471    .TOC   *       FIRST TWO LEVELS ONLY [AMUX,BMUX]
1472    !N.B.:  FOR USE WHEN SHIFTING SR RIGHT, SR<15> <- BMUX<00>
1473    .MACRO D-DIRECT[BMUX]           ::=  AMUX/DIRECT,BMUX/DIRECT
1474
1475
1476
1477    !.PAGE=========================================================================================================================
1478
1479    .TOC   *     ALU FUNCTIONS
1480    ![SEE FIELD DESCRIPTION OF "ALU" FOR FULL DESCRIPTION]
1481    .MACRO ZERO                     ::=  ALU/ZERO
1482    .MACRO A-XOR-B                  ::=  ALU/A-XOR-B
1483    .MACRO B                        ::=  ALU/B
1484    .MACRO A-AND-B                  ::=  ALU/A-AND-B
1485    .MACRO A-IOR-B                  ::=  ALU/A-IOR-B
1486    .MACRO A                        ::=  ALU/A
1487    .MACRO NOT-A                    ::=  ALU/NOT-A
1488    .MACRO NOT-A-AND-B              ::=  ALU/NOT-A-AND-B
1489    .MACRO A-AND-NOT-B              ::=  ALU/A-AND-NOT-B
1490
1491    .MACRO DIVIDE                   ::=  ALU/DIVIDE
1492    .MACRO A-PLUS-B                 ::=  ALU/A-PLUS-B
1493    .MACRO A-MINUS-B                ::=  ALU/A-MINUS-B
1494    .MACRO A-PLUS-B-PLUS-PS[C]      ::=  ALU/A-PLUS-B-PLUS-PS[C]
1495    .MACRO A-PLUS-B-PLUS-D[C]       ::=  ALU/A-PLUS-B-PLUS-D[C]
1496    .MACRO A-PLUS-NOT-B-PLUS-D[C]   ::=  ALU/A-PLUS-NOT-B-PLUS-D[C]
1497    .MACRO A-PLUS-B-PLUS-1          ::=  ALU/A-PLUS-B-PLUS-1
1498
1499
1500    .TOC   *     COUT GENERATION
1501    ![SEE FIELD DESCRIPTION OF "COUT" FOR FULL DESCRIPTION]
1502    .MACRO COUT←CIN                 ::=  COUT/CIN
1503    .MACRO COUT←PS[C]               ::=  COUT/PS[C]
1504    .MACRO COUT←ALU00               ::=  COUT/ALU00
1505    .MACRO COUT←ALU07               ::=  COUT/ALU07
1506    .MACRO COUT←ALU15               ::=  COUT/ALU15
1507    .MACRO COUT←COUT07              ::=  COUT/COUT07
1508    .MACRO COUT←COUT15              ::=  COUT/COUT15
1509    .MACRO COUT←D[C]                ::=  COUT/D[C]
1510
1511
1512
```

```
1513    !.PAGE=========================================================================================================================
1514
1515    .TOC    *      CLOCKS
1516
1517
1518
1519    .TOC    *          BASIC REGISTER CLOCKS [D, SR, BA, CC]
1520    .MACRO CLK-D                        ::=  CLKD/YES    !MUST SPECIFY P2 T OR P3 T
1521    .MACRO CLK-SR                       ::=  CLKSR/YES   !MUST SPECIFY P2 T OR P3 T
1522    .MACRO CLK-BA                       ::=  CLKBA/YES   !AT P1 T ONLY
1523    .MACRO SET-CC                       ::=  SCC/YES     !SETUP HERE, CLOCKED AT P2 T  **OF NEXT UWORD**  ONLY
1524    .MACRO CLK-CC                       ::=  NULL        !IN NEXT UWORD, FOR DOCUMENTATION
1525
1526
1527
1528    .TOC    *          REDEFINED FROM SP REWRITE FIELD [RES, COUNTER]
1529    .MACRO LOAD-RES                     ::=  MOD/LOADREG,LOADRES/YES     !AT P2 T ONLY, FROM B-BUS<14:11>
1530    .MACRO LOAD-COUNTER                 ::=  MOD/LOADREG,LOADCOUNT/YES   !DURING ENTIRE UWORD, FROM B-BUS<7:0>
1531
1532
1533
1534    .TOC    *          RES REGISTER CONTROL VALUES [FROM EMIT]
1535    !LOADED VIA:  EMIT<14:11> -> CSP[XX]<14:11> -> B-BUS<14:11> -> RES<3:0>
1536    .MACRO SENDMUX-0123-SEL             ::=  EMIT14/1                    !FOR SHIFT TREE
1537    .MACRO SENDMUX-4567-SEL             ::=  EMIT14/0                    !FOR SHIFT TREE
1538    .MACRO SR-LOAD                      ::=  EMIT13/0,EMIT12/0           !FOR SR/GUARD
1539    .MACRO SR-LEFT                      ::=  EMIT13/0,EMIT12/1           !FOR SR/GUARD
1540    .MACRO SR-RIGHT                     ::=  EMIT13/1,EMIT12/0           !FOR SR/GUARD
1541    .MACRO SR-NOP                       ::=  EMIT13/1,EMIT12/1           !FOR SR/GUARD
1542    .MACRO GUARD-EN                     ::=  EMIT11/1                    !FOR SR/GUARD
1543    .MACRO GUARD-DIS                    ::=  EMIT11/0                    !FOR SR/GUARD
1544
1545
1546
1547
1548    .TOC    *          CC CONTROL  [FROM EMIT]
1549    !USED VIA: BUS-U37-H -> EMIT07-H -> MODIFY-V(1)-H
1550    .MACRO MODIFY-VBIT                  ::=  EMIT07/1
1551    .MACRO NOT-MODIFY-VBIT              ::=  EMIT07/0
1552
1553
1554
1555    !.PAGE=========================================================================================================================
1556
1557    .TOC    *      BUS CONTROL MACROS
1558    .MACRO DATI-CLKIR       ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATI-CLKIR
1559    .MACRO DATI-NOINT       ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATI-NOINT
1560    .MACRO DATI             ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATI
1561    .MACRO DATI[P]          ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATI[P]       !WITH ALTER/ALLOWED
1562    .MACRO DATO             ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATO
1563    .MACRO DATIB            ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATIB
1564    .MACRO DATIB[P]         ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATIB[P]      !WITH ALTER/ALLOWED
1565    .MACRO DATIP            ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATIP
1566    .MACRO DATOB            ::=  BEGIN/YES,SELECT/BUS,BUSCODE/DATOB
```

```
1567    .MACRO INVALIDATE       ::=  BEGIN/YES,SELECT/BUS,BUSCODE/INVALIDATE
1568
1569
1570
1571    .TOC   *     KT/KJ CONTROL FUNCTIONS
1572
1573          !THESE BITS ACTUALLY ARISE OUT OF THE BASE MACHINE EXTENSION ROMS,
1574          !AND AS SUCH ARENT DIRECTLY ACCESSIBLE FROM THE DCS.  THEY ARE
1575          !INCLUDED HERE ONLY FOR DOCUMENTATION PURPOSES.
1576
1577    .MACRO KJ-ENABLE        ::=  KJ/ONE
1578
1579    .MACRO MAINTENANCE      ::=  UKTEN/ONE
1580    .MACRO CURRENT-MODE     ::=  UKT01/ONE,UKT00/ZERO
1581    .MACRO KERNAL-MODE      ::=  UKT01/ONE,UKT00/ONE
1582    .MACRO MT-MODE          ::=  UKT01/ZERO,UKT00/ONE
1583    .MACRO MF-MODE          ::=  UKT01/ZERO,UKT00/ZERO
1584
1585
1586
1587    !.PAGE=========================================================================================================
1588
1589    .TOC   *     UCON CONTROL MACROS
1590    .MACRO SET-UCON-CONTROL         ::=  BEGIN/YES,SELECT/UCON,UCON-LOAD/YES  !LOAD UCON CONTROL REGISTER AT PO
1591    .MACRO UCON-OPERATION           ::=  BEGIN/YES,SELECT/UCON,UCON-XFER/YES  !PERFORM UCON OPERATION
1592
1593
1594
1595    .TOC   *       PROCESSOR UCON CONTROL SETUP
1596    .MACRO UCON-PROC                ::=  UCON-SEL-PROC/YES                    !SELECT PROCESSOR
1597    .MACRO EN-CLK-IR[15-00]         ::=  UCON15/1                             !ENABLE OPERATIONS
1598    .MACRO EN-CLK-PS[15-12]         ::=  UCON14/1                             !
1599    .MACRO EN-CLK-FLAG[8-0]         ::=  UCON13/1                             !
1600    .MACRO EN-CLK-FPS[7-4]          ::=  UCON12/1                             !
1601    .MACRO EN-CLK-PS[7-4]           ::=  UCON11/1                             !
1602    .MACRO EN-CLK-PS[3-0]           ::=  UCON10/1                             !
1603    .MACRO EN-CLK-UBREAK[11-00]     ::=  UCON09/1                             !
1604          !UCON<8:7> ARE NOT USED IN PROCESSOR CONTROL
1605    .MACRO BUSDIN←EMIT[15-00]       ::=  UCON06/0,UCON05/0                    !HBMUX SELECT
1606    .MACRO BUSDIN←CUA[14-03]        ::=  UCON06/0,UCON05/1                    !
1607    .MACRO BUSDIN←PS[15-00]         ::=  UCON06/1,UCON05/0                    !
1608    .MACRO BUSDIN←FLAG[8-0]#FPS[7-0] ::=  UCON06/1,UCON05/1                   !
1609
1610
1611
1612
1613    .TOC   *       DCS/WCS/ECS CONTROL
1614    .MACRO UCON-DCS                 ::=  UCON-SEL←WCS/YES                     !SELECT DCS
1615    .MACRO BUSDIN←TNUA[11-00]       ::=  UCON14/0                             !DCS BUSDIN MUX SEL
1616    .MACRO BUSDIN←ERR#EOP#ERRCOD[11-00]    ::=  UCON14/1                      !
1617    .MACRO START-DCS                ::=  UCON15/1                             !
1618
1619
1620
```

```
1621    .TOC   *       CACHE/KT UCON CONTROL
1622    .MACRO UCON-CACHE-KT                          ::=  UCON-SEL-CACHEKT/YES      !SELECT CACHE / KT UCON FUNCTION
1623           !UCON<15> NOT USED HERE
1624    .MACRO EN-KT-NO-RELOCATE                      ::=  UCON14/1                  !INHIBIT KT FROM ANY RELOCATION OF BA -> PBA
1625    .MACRO BUSDIN←BUS-INTERNAL-ADDR[15-00]        ::=  UCON13/0,UCON12/1         !FROM INTERNAL ADDR ROM
1626    .MACRO BUSDIN←CPU-INTERNAL-ADDR[15-00]        ::=  UCON13/1,UCON12/1         ! DITTO ...
1627    .MACRO BUSDIN←MMR2[15-00]                     ::=  UCON11/1,UCON09/0         !VIRTUAL PC
1628    .MACRO BUSDIN←CACHE-STATUS[15-00]             ::=  UCON11/1,UCON09/1         !CACHE INFO
1629    .MACRO BUSDIN←KT-SEL                          ::=  UCON10/1                  !FOR PAR-S, PDR-S ETC
1630    .MACRO KT-WRITE-HIGH                          ::=  UCON08/1                  !WRITE REGISTER <15:08>
1631    .MACRO KT-WRITE-LOW                           ::=  UCON07/1                  !WRITE REGISTER <07:00>
1632    .MACRO KT-WRITE                               ::=  UCON08/1,UCON07/1         !WRITE REGISTER <15:00>
1633    .MACRO KT-SEL-SLR&CCR                         ::=  UCON06/0,UCON05/0         !SELECT KT-MUX OUTPUT
1634    .MACRO KT-SEL-MMR0                            ::=  UCON06/0,UCON05/1         !
1635    .MACRO KT-SEL-PDR                             ::=  UCON06/1,UCON05/0         !
1636    .MACRO KT-SEL-PAR                             ::=  UCON06/1,UCON05/1         !
1637
1638
1639
1640
1641    .TOC   *       I/O UCON CONTROL
1642    .MACRO UCON-I-O                       ::=  UCON-SEL-I-O/YES                  !SELECT I-O CONTROL
1643
1644
1645
1646    .TOC   *         BUS CONTROL
1647    .MACRO EN-LOAD-DBUF[15-00]            ::=  UCON15/1                          !EN LOAD DBUF AT P3
1648    .MACRO BUSDIN←DBUF[15-00]             ::=  UCON15/1                          !DBUF ON BUSDIN
1649    .MACRO EN-STATUS-MUX                  ::=  UCON15/0                          !STATUS-MUX ENABLE ON BUSDIN
1650           !UCON<14:11> ARE NOT USED IN UCON BUS CONTROL
1651    .MACRO BUSDIN←SERVICE[15-00]          ::=  UCON10/0,UCON09/1                 !
1652    .MACRO BUSDIN←JAM[15-00]              ::=  UCON10/1,UCON09/0                 !
1653    .MACRO BUSDIN←PBA[15-00]              ::=  UCON10/1,UCON09/1                 !
1654    .MACRO DMUX←CACHEDATA[15-00]          ::=  UCON08/1                          !
1655    .MACRO EN-BC-FCN-0                    ::=  UCON07/0,UCON06/0,UCON05/0        !SELECT BUS CONTROL FUNCTION
1656    .MACRO EN-START-DELAY                 ::=  UCON07/0,UCON06/0,UCON05/1        !
1657    .MACRO EN-CLR-JAM-ERRORS              ::=  UCON07/0,UCON06/1,UCON05/0        !
1658    .MACRO EN-CLR-NPR-TIMEOUT             ::=  UCON07/0,UCON06/1,UCON05/1        !
1659    .MACRO EN-CLR-PWR-FAIL                ::=  UCON07/1,UCON06/0,UCON05/0        !
1660    .MACRO EN-CLR-YELLOW-ZONE             ::=  UCON07/1,UCON06/0,UCON05/1        !
1661    .MACRO EN-ALLOW-BG[1]H                ::=  UCON07/1,UCON06/1,UCON05/0        !
1662    .MACRO EN-BUS-INIT-UCON               ::=  UCON07/1,UCON06/1,UCON05/1        !
1663
1664
1665
1666    .TOC   *           CONSOLE I-O
1667    .MACRO EN-CONSOLE-COMMAND             ::=  UCON15/0,UCON14/0                 !SETS UP UCON I-O BITS FOR CONSOLE COMMANDS
1668                                                                                 !ALSO SELECTS STATUS-MUX ON BUSDIN
1669    .MACRO EN-CNSL-NOP                    ::=  UCON13/0,UCON12/0,UCON11/0        !ENABLE CONSOLE NO OPERATION
1670    .MACRO EN-CLR-COUNTR                  ::=  UCON13/0,UCON12/0,UCON11/1        !ENABLE CLEAR DIGIT PAIR COUNTER
1671    .MACRO EN-INCR-COUNTR                 ::=  UCON13/0,UCON12/1,UCON11/0        !ENABLE BUMP TO NEXT DIGIT PAIR
1672    .MACRO EN-CLR-CNSL-SRVC               ::=  UCON13/0,UCON12/1,UCON11/1        !ENABLE CLEAR CONSOLE SERVICE RØST FLOP
1673    .MACRO EN-STRB-DISP                   ::=  UCON13/1,UCON12/0,UCON11/0        !ENABLE WRITE DIGIT PAIR TO DISPLAY LATCH
1674    .MACRO EN-CLR-CNSL                    ::=  UCON13/1,UCON12/0,UCON11/1        !ENABLE CLEAR CONSOLE LED
```

```
1675    .MACRO EN-SET-CNSL              ::=  UCON13/1,UCON12/1,UCON11/0      !ENABLE SET CONSOLE LED
1676    .MACRO EN-SET-DP                ::=  UCON13/1,UCON12/1,UCON11/1      !ENABLE SET ALL DP LEDS
1677    .MACRO BUSDIN←CONSOLE[06-00]    ::=  UCON10/0,UCON09/0               !STATUS-MUX SELECT
1678            !UCON<8:5> ARE NOT USED IN UCON CONSOLE CONTROL
1679
1680
1681
1682    .TOC    *          REMOTE CONSOLE INTERFACE
1683    !N.B.:  "EN CONSOLE COMMAND" DOES NOT APPLY TO REMOTE CONSOLE
1684    .MACRO EN-REMSTRB               ::=  UCON14/1                        !EN REMOTE CONSOLE STROBE
1685    .MACRO EN-REMCODE1              ::=  UCON12/1                        !EN SPECIAL CODE 1
1686    .MACRO EN-REMCODE0              ::=  UCON11/1                        !EN SPECIAL CODE 0
1687
1688
1689
1690    !.PAGE==========================================================================================
1691
1692    .TOC    *      DCS ROM EXTENSION MACROS
1693
1694    .TOC    *         GENERAL FUNCTIONS
1695    .MACRO LOAD-ENUA(MICROADDR)     ::=  LOAD-ENUA-ERRCOD/YES,           !SPECIFY LOAD
1696                                           ENUA/@MICROADDR               !AND VALUE
1697    .MACRO LOAD-ERROR(MICROADDR)    ::=  LOAD-ENUA-ERRCOD/YES            !FOR EFFECT ONLY - ALWAYS ACCOMPANIES ABOVE
1698    .MACRO BUMP-VERIFY              ::=  VERIFY/BUMP                     !BUMP VERIFY COUNTER WHEN IN SELF TEST MODE
1699    .MACRO SIGNAL-EOP               ::=  EOP/SIGNAL                      !SIGNAL END OF PASS
1700    .MACRO DCS-CTR(XX)              ::=  LOAD-DCS-CTR/YES,               !SPECIFY LOAD COUNTER (DCS!)
1701                                           CTR/@XX                       !AND VALUE
1702
1703
1704
1705    .TOC    *        DAD<1:0> BIT FUNCTIONS
1706    .MACRO NO-DAD                   ::=  DAD/NO-DAD                      !DON'T ASSERT DAD BITS
1707    .MACRO FIRST-1-OR-2             ::=  DAD/FIRST-1-OR-2                !SELECT CSP CONSTANT 1/2, FIRST USE
1708    .MACRO SECOND-1-OR-2            ::=  DAD/SECOND-1-OR-2               !SELECT CSP CONSTANT 1/2, SECOND USE
1709    .MACRO WRITE-BYTE               ::=  DAD/WRITE-BYTE                  !BYTE WRITE ENABLE TO ASP/BSP
1710    .MACRO BYTE-WRITE               ::=  DAD/WRITE-BYTE                  !  "
1711
1712
1713
1714    .TOC    *        DIAGNOSTIC MODE BUT ENABLES
1715
1716    .MACRO BUTD[SCOPE]              ::=  SCOPE/ENABLED                   !ENABLE SCOPE LOOPING CHECK
1717    .MACRO BUTD[ERROR]              ::=  SCOPE/ENABLED                   !FORCES NUA00=0 IF ERROR[1]H SET
1718
1719    .MACRO BUTD[VERIFY-MODE]        ::=  NULL                            !CHECK IMPLICITLY FOR VERIFY MODE
1720                                                                         !'SIGNAL EOP' MUST BE PRESENT IN SAME WORD
1721                                                                         !FORCES NUA01=0 IF VERIFY SWITCH SET
1722
1723    .MACRO BUTD[EOP-OVERFLOW]       ::=  NULL                            !AFTER 'SIGNAL EOP' GIVEN, ADDRESS IS FORCED
1724                                                                         !TO (4000) IF HARDWARE EOP/VERIFY COUNTER
1725                                                                         !HAS NOT YET OVERFLOWED, FORCING ANOTHER
1726                                                                         !PASS.  ELSE ADDRESS IN UPF IS TAKEN UNMODIFIED.
1727
1728
```

```
1729
1730    !.PAGE=========================================================================================================
1731
1732    .TOC   *     MICROBRANCH FIELD MACROS
1733    ![SEE <UBF> FIELD DESCRIPTION FOR FULL INFO]
1734
1735    .MACRO BUT(XX)                  ::=  UBF/@XX                    !INACTIVE, FULL WIDTH
1736    .MACRO BUTR(XX)                 ::=  UBF/@XX                    !INACTIVE, RESTRICTED WIDTH
1737
1738    .MACRO BUTA(XX)                 ::=  UBF/@XX                    !ACTIVE, FULL WIDTH
1739    .MACRO BUTRA(XX)                ::=  UBF/@XX                    !ACTIVE, RESTRICTED WIDTH
1740
1741    .MACRO TEST(XX)                 ::=  MULTIPLE/@XX               !FOR BUTR(MULTIPLE) SETUP
1742    .MACRO BUTM(XX)                 ::=  MULTIPLE/@XX,UBF/@XX       !A MULTIPLE BUTR
1743
1744
1745
1746    !.PAGE=========================================================================================================
1747
1748    .TOC   *     MISCELLANEOUS
1749
1750    .TOC   *       OTHER SOURCES ENABLED FOR A-BUS
1751    .MACRO SR                       ::=  AEN/XMUX,ASELO/SR
1752    .MACRO FLTPT                    ::=  AEN/XMUX,ASELO/FLTPT
1753
1754
1755
1756    .TOC   *       PAGING, RETURN REGISTER
1757
1758           !PAGE FIELD ONLY:
1759    .MACRO PAGE(X)                  ::=  NEXT-PAGE/@X
1760
1761           !PAGE FIELD AND BUT[SUBR B]:
1762    .MACRO GOTO-PAGE(X)             ::=  NEXT-PAGE/@X,UBF/SUBR-B
1763
1764           !RETURN REGISTER <- D<14:03>, PAGE <- EMIT<02:00> ON BUTA(SUBR-A)
1765    .MACRO RETURN←D[14-03]          ::=  UBF/SUBR-A
1766
1767
1768
1769    !.PAGE=========================================================================================================
1770
1771    .TOC   *   ADVANCED OPERATIONS
1772
1773
1774
1775    .TOC   *     DATA INTO CSP, AT P3 ONLY
1776
1777           !N.B.:  BUSDIN IS ANY BUT EMIT [OVERLAPS BSEL<1:0>]
1778    .MACRO CSPB[14]←BUSDIN          ::=  CSPB(B14),WR-CSP
1779    .MACRO CSPB[15]←BUSDIN          ::=  CSPB(B15),WR-CSP
1780    .MACRO CSPB[16]←BUSDIN          ::=  CSPB(B16),WR-CSP
1781    .MACRO CSPB[17]←BUSDIN          ::=  CSPB(B17),WR-CSP
1782
```

```
1783            !N.B.:  GETS WHATEVER IS ON BUSDIN
1784    .MACRO CSPD[00]←BUSDIN          ::=  CSPD(D00),WR-CSP
1785    .MACRO CSPD[01]←BUSDIN          ::=  CSPD(D01),WR-CSP
1786    .MACRO CSPD[02]←BUSDIN          ::=  CSPD(D02),WR-CSP
1787    .MACRO CSPD[03]←BUSDIN          ::=  CSPD(D03),WR-CSP
1788    .MACRO CSPD[04]←BUSDIN          ::=  CSPD(D04),WR-CSP
1789    .MACRO CSPD[05]←BUSDIN          ::=  CSPD(D05),WR-CSP
1790    .MACRO CSPD[06]←BUSDIN          ::=  CSPD(D06),WR-CSP
1791    .MACRO CSPD[07]←BUSDIN          ::=  CSPD(D07),WR-CSP
1792    .MACRO CSPD[10]←BUSDIN          ::=  CSPD(D10),WR-CSP
1793    .MACRO CSPD[11]←BUSDIN          ::=  CSPD(D11),WR-CSP
1794    .MACRO CSPD[12]←BUSDIN          ::=  CSPD(D12),WR-CSP
1795    .MACRO CSPD[13]←BUSDIN          ::=  CSPD(D13),WR-CSP
1796    .MACRO CSPD[14]←BUSDIN          ::=  CSPD(D14),WR-CSP
1797    .MACRO CSPD[15]←BUSDIN          ::=  CSPD(D15),WR-CSP
1798    .MACRO CSPD[16]←BUSDIN          ::=  CSPD(D16),WR-CSP
1799    .MACRO CSPD[17]←BUSDIN          ::=  CSPD(D17),WR-CSP
1800
1801            !N.B.:  REQUIRED THAT BUSDIN←EMIT[15-00] PREVIOUSLY SET UP
1802    .MACRO CSPD[00]←EMIT            ::=  CSPD(D00),WR-CSP
1803    .MACRO CSPD[01]←EMIT            ::=  CSPD(D01),WR-CSP
1804    .MACRO CSPD[02]←EMIT            ::=  CSPD(D02),WR-CSP
1805    .MACRO CSPD[03]←EMIT            ::=  CSPD(D03),WR-CSP
1806    .MACRO CSPD[04]←EMIT            ::=  CSPD(D04),WR-CSP
1807    .MACRO CSPD[05]←EMIT            ::=  CSPD(D05),WR-CSP
1808    .MACRO CSPD[06]←EMIT            ::=  CSPD(D06),WR-CSP
1809    .MACRO CSPD[07]←EMIT            ::=  CSPD(D07),WR-CSP
1810    .MACRO CSPD[10]←EMIT            ::=  CSPD(D10),WR-CSP
1811    .MACRO CSPD[11]←EMIT            ::=  CSPD(D11),WR-CSP
1812    .MACRO CSPD[12]←EMIT            ::=  CSPD(D12),WR-CSP
1813    .MACRO CSPD[13]←EMIT            ::=  CSPD(D13),WR-CSP
1814    .MACRO CSPD[14]←EMIT            ::=  CSPD(D14),WR-CSP
1815    .MACRO CSPD[15]←EMIT            ::=  CSPD(D15),WR-CSP
1816    .MACRO CSPD[16]←EMIT            ::=  CSPD(D16),WR-CSP
1817    .MACRO CSPD[17]←EMIT            ::=  CSPD(D17),WR-CSP
1818
1819
1820
1821    .TOC   *     MISC CONSTANTS INTO ASP, BSP, AT P2-T * P3
1822
1823    .MACRO A*BSPHI[C100000]←D       ::=  ASP(C100000),BSP(C100000),WR(AB,H,B)
1824    .MACRO A*BSPHI[C000200]←D       ::=  ASP(C000200),BSP(C000200),WR(AB,H,B)
1825    .MACRO A*BSPHI[C000000]←D       ::=  ASP(C000000),BSP(C000000),WR(AB,H,B)
1826    .MACRO A*BSPHI[C177777]←D       ::=  ASP(C177777),BSP(C177777),WR(AB,H,B)
1827    .MACRO A*BSPHI[C000001]←D       ::=  ASP(C000001),BSP(C000001),WR(AB,H,B)
1828    .MACRO A*BSPHI[C052525]←D       ::=  ASP(C052525),BSP(C052525),WR(AB,H,B)
1829    .MACRO A*BSPHI[C125252]←D       ::=  ASP(C125252),BSP(C125252),WR(AB,H,B)
1830
1831    .MACRO A*BSPHI[C100000]←D-[B]   ::=  BSP(C100000),WR(AB,H,B)
1832    .MACRO A*BSPHI[C000200]←D-[B]   ::=  BSP(C000200),WR(AB,H,B)
1833    .MACRO A*BSPHI[C000000]←D-[B]   ::=  BSP(C000000),WR(AB,H,B)
1834    .MACRO A*BSPHI[C177777]←D-[B]   ::=  BSP(C177777),WR(AB,H,B)
1835    .MACRO A*BSPHI[C000001]←D-[B]   ::=  BSP(C000001),WR(AB,H,B)
1836    .MACRO A*BSPHI[C052525]←D-[B]   ::=  BSP(C052525),WR(AB,H,B)
```

```
1837    .MACRO A#BSPHI[C125252]←D-[B]  ::=  BSP(C125252),WR(AB,H,B)
1838
1839    .MACRO A#BSPHI[C100000]←D-[A]  ::=  ASP(C100000),WR(AB,H,A)
1840    .MACRO A#BSPHI[C000200]←D-[A]  ::=  ASP(C000200),WR(AB,H,A)
1841    .MACRO A#BSPHI[C000000]←D-[A]  ::=  ASP(C000000),WR(AB,H,A)
1842    .MACRO A#BSPHI[C177777]←D-[A]  ::=  ASP(C177777),WR(AB,H,A)
1843    .MACRO A#BSPHI[C000001]←D-[A]  ::=  ASP(C000001),WR(AB,H,A)
1844    .MACRO A#BSPHI[C052525]←D-[A]  ::=  ASP(C052525),WR(AB,H,A)
1845    .MACRO A#BSPHI[C125252]←D-[A]  ::=  ASP(C125252),WR(AB,H,A)
1846
1847
1848
1849    .TOC   *     DATA INTO ASP, BSP, AT P2-T * P3
1850
1851    .MACRO ASPLO[17]←CSPB(XX)      ::=  B,ASPLO(R17),CSPB(@XX),CLK-D,P2-T,WR(A,L,A)
1852    .MACRO ASPLO[17]←CSPD(XX)      ::=  B,ASPLO(R17),CSPD(@XX),CLK-D,P2-T,WR(A,L,A)
1853    .MACRO PC←D                    ::=  PC-A,WR(AB,L,A)
1854    .MACRO RS←D                    ::=  RS-A,WR(AB,L,A)
1855
1856    .MACRO ASPLO[00]←D             ::=  ASP(R00),WR(A,L,A)
1857    .MACRO ASPLO[01]←D             ::=  ASP(R01),WR(A,L,A)
1858    .MACRO ASPLO[02]←D             ::=  ASP(R02),WR(A,L,A)
1859    .MACRO ASPLO[03]←D             ::=  ASP(R03),WR(A,L,A)
1860    .MACRO ASPLO[04]←D             ::=  ASP(R04),WR(A,L,A)
1861    .MACRO ASPLO[05]←D             ::=  ASP(R05),WR(A,L,A)
1862    .MACRO ASPLO[06]←D             ::=  ASP(R06),WR(A,L,A)
1863    .MACRO ASPLO[07]←D             ::=  ASP(R07),WR(A,L,A)
1864    .MACRO ASPLO[10]←D             ::=  ASP(R10),WR(A,L,A)
1865    .MACRO ASPLO[11]←D             ::=  ASP(R11),WR(A,L,A)
1866    .MACRO ASPLO[12]←D             ::=  ASP(R12),WR(A,L,A)
1867    .MACRO ASPLO[13]←D             ::=  ASP(R13),WR(A,L,A)
1868    .MACRO ASPLO[14]←D             ::=  ASP(R14),WR(A,L,A)
1869    .MACRO ASPLO[15]←D             ::=  ASP(R15),WR(A,L,A)
1870    .MACRO ASPLO[16]←D             ::=  ASP(R16),WR(A,L,A)
1871    .MACRO ASPLO[17]←D             ::=  ASP(R17),WR(A,L,A)
1872
1873    .MACRO ASPHI[00]←D             ::=  ASP(R00),WR(A,H,A)
1874    .MACRO ASPHI[01]←D             ::=  ASP(R01),WR(A,H,A)
1875    .MACRO ASPHI[02]←D             ::=  ASP(R02),WR(A,H,A)
1876    .MACRO ASPHI[03]←D             ::=  ASP(R03),WR(A,H,A)
1877    .MACRO ASPHI[04]←D             ::=  ASP(R04),WR(A,H,A)
1878    .MACRO ASPHI[05]←D             ::=  ASP(R05),WR(A,H,A)
1879    .MACRO ASPHI[06]←D             ::=  ASP(R06),WR(A,H,A)
1880    .MACRO ASPHI[07]←D             ::=  ASP(R07),WR(A,H,A)
1881    .MACRO ASPHI[10]←D             ::=  ASP(R10),WR(A,H,A)
1882    .MACRO ASPHI[11]←D             ::=  ASP(R11),WR(A,H,A)
1883    .MACRO ASPHI[12]←D             ::=  ASP(R12),WR(A,H,A)
1884    .MACRO ASPHI[13]←D             ::=  ASP(R13),WR(A,H,A)
1885    .MACRO ASPHI[14]←D             ::=  ASP(R14),WR(A,H,A)
1886    .MACRO ASPHI[15]←D             ::=  ASP(R15),WR(A,H,A)
1887    .MACRO ASPHI[16]←D             ::=  ASP(R16),WR(A,H,A)
1888    .MACRO ASPHI[17]←D             ::=  ASP(R17),WR(A,H,A)
1889
1890    .MACRO BSPLO[00]←D             ::=  BSP(R00),WR(B,L,B)
```

```
1891    .MACRO BSPLO[01]+D              ::=  BSP(R01),WR(B,L,B)
1892    .MACRO BSPLO[02]+D              ::=  BSP(R02),WR(B,L,B)
1893    .MACRO BSPLO[03]+D              ::=  BSP(R03),WR(B,L,B)
1894    .MACRO BSPLO[04]+D              ::=  BSP(R04),WR(B,L,B)
1895    .MACRO BSPLO[05]+D              ::=  BSP(R05),WR(B,L,B)
1896    .MACRO BSPLO[06]+D              ::=  BSP(R06),WR(B,L,B)
1897    .MACRO BSPLO[07]+D              ::=  BSP(R07),WR(B,L,B)
1898    .MACRO BSPLO[10]+D              ::=  BSP(R10),WR(B,L,B)
1899    .MACRO BSPLO[11]+D              ::=  BSP(R11),WR(B,L,B)
1900    .MACRO BSPLO[12]+D              ::=  BSP(R12),WR(B,L,B)
1901    .MACRO BSPLO[13]+D              ::=  BSP(R13),WR(B,L,B)
1902    .MACRO BSPLO[14]+D              ::=  BSP(R14),WR(B,L,B)
1903    .MACRO BSPLO[15]+D              ::=  BSP(R15),WR(B,L,B)
1904    .MACRO BSPLO[16]+D              ::=  BSP(R16),WR(B,L,B)
1905    .MACRO BSPLO[17]+D              ::=  BSP(R17),WR(B,L,B)
1906
1907    .MACRO BSPHI[00]+D              ::=  BSP(R00),WR(B,H,B)
1908    .MACRO BSPHI[01]+D              ::=  BSP(R01),WR(B,H,B)
1909    .MACRO BSPHI[02]+D              ::=  BSP(R02),WR(B,H,B)
1910    .MACRO BSPHI[03]+D              ::=  BSP(R03),WR(B,H,B)
1911    .MACRO BSPHI[04]+D              ::=  BSP(R04),WR(B,H,B)
1912    .MACRO BSPHI[05]+D              ::=  BSP(R05),WR(B,H,B)
1913    .MACRO BSPHI[06]+D              ::=  BSP(R06),WR(B,H,B)
1914    .MACRO BSPHI[07]+D              ::=  BSP(R07),WR(B,H,B)
1915    .MACRO BSPHI[10]+D              ::=  BSP(R10),WR(B,H,B)
1916    .MACRO BSPHI[11]+D              ::=  BSP(R11),WR(B,H,B)
1917    .MACRO BSPHI[12]+D              ::=  BSP(R12),WR(B,H,B)
1918    .MACRO BSPHI[13]+D              ::=  BSP(R13),WR(B,H,B)
1919    .MACRO BSPHI[14]+D              ::=  BSP(R14),WR(B,H,B)
1920    .MACRO BSPHI[15]+D              ::=  BSP(R15),WR(B,H,B)
1921    .MACRO BSPHI[16]+D              ::=  BSP(R16),WR(B,H,B)
1922    .MACRO BSPHI[17]+D              ::=  BSP(R17),WR(B,H,B)
1923
1924    .MACRO A@BSPLO[00]+D            ::=  ASP(R00),BSP(R00),WR(AB,L,A)
1925    .MACRO A@BSPLO[01]+D            ::=  ASP(R01),BSP(R01),WR(AB,L,A)
1926    .MACRO A@BSPLO[02]+D            ::=  ASP(R02),BSP(R02),WR(AB,L,A)
1927    .MACRO A@BSPLO[03]+D            ::=  ASP(R03),BSP(R03),WR(AB,L,A)
1928    .MACRO A@BSPLO[04]+D            ::=  ASP(R04),BSP(R04),WR(AB,L,A)
1929    .MACRO A@BSPLO[05]+D            ::=  ASP(R05),BSP(R05),WR(AB,L,A)
1930    .MACRO A@BSPLO[06]+D            ::=  ASP(R06),BSP(R06),WR(AB,L,A)
1931    .MACRO A@BSPLO[07]+D            ::=  ASP(R07),BSP(R07),WR(AB,L,A)
1932    .MACRO A@BSPLO[10]+D            ::=  ASP(R10),BSP(R10),WR(AB,L,A)
1933    .MACRO A@BSPLO[11]+D            ::=  ASP(R11),BSP(R11),WR(AB,L,A)
1934    .MACRO A@BSPLO[12]+D            ::=  ASP(R12),BSP(R12),WR(AB,L,A)
1935    .MACRO A@BSPLO[13]+D            ::=  ASP(R13),BSP(R13),WR(AB,L,A)
1936    .MACRO A@BSPLO[14]+D            ::=  ASP(R14),BSP(R14),WR(AB,L,A)
1937    .MACRO A@BSPLO[15]+D            ::=  ASP(R15),BSP(R15),WR(AB,L,A)
1938    .MACRO A@BSPLO[16]+D            ::=  ASP(R16),BSP(R16),WR(AB,L,A)
1939    .MACRO A@BSPLO[17]+D            ::=  ASP(R17),BSP(R17),WR(AB,L,A)
1940
1941    .MACRO A@BSPHI[00]+D            ::=  ASP(R00),BSP(R00),WR(AB,H,A)
1942    .MACRO A@BSPHI[01]+D            ::=  ASP(R01),BSP(R01),WR(AB,H,A)
1943    .MACRO A@BSPHI[02]+D            ::=  ASP(R02),BSP(R02),WR(AB,H,A)
1944    .MACRO A@BSPHI[03]+D            ::=  ASP(R03),BSP(R03),WR(AB,H,A)
```

```
1945    .MACRO A#BSPHI[04]←D            ::=  ASP(R04),BSP(R04),WR(AB,H,A)
1946    .MACRO A#BSPHI[05]←D            ::=  ASP(R05),BSP(R05),WR(AB,H,A)
1947    .MACRO A#BSPHI[06]←D            ::=  ASP(R06),BSP(R06),WR(AB,H,A)
1948    .MACRO A#BSPHI[07]←D            ::=  ASP(R07),BSP(R07),WR(AB,H,A)
1949    .MACRO A#BSPHI[10]←D            ::=  ASP(R10),BSP(R10),WR(AB,H,A)
1950    .MACRO A#BSPHI[11]←D            ::=  ASP(R11),BSP(R11),WR(AB,H,A)
1951    .MACRO A#BSPHI[12]←D            ::=  ASP(R12),BSP(R12),WR(AB,H,A)
1952    .MACRO A#BSPHI[13]←D            ::=  ASP(R13),BSP(R13),WR(AB,H,A)
1953    .MACRO A#BSPHI[14]←D            ::=  ASP(R14),BSP(R14),WR(AB,H,A)
1954    .MACRO A#BSPHI[15]←D            ::=  ASP(R15),BSP(R15),WR(AB,H,A)
1955    .MACRO A#BSPHI[16]←D            ::=  ASP(R16),BSP(R16),WR(AB,H,A)
1956    .MACRO A#BSPHI[17]←D            ::=  ASP(R17),BSP(R17),WR(AB,H,A)
1957
1958    .MACRO A#BSPLO[00]←D-[A]        ::=  ASP(R00),WR(AB,L,A)
1959    .MACRO A#BSPLO[01]←D-[A]        ::=  ASP(R01),WR(AB,L,A)
1960    .MACRO A#BSPLO[02]←D-[A]        ::=  ASP(R02),WR(AB,L,A)
1961    .MACRO A#BSPLO[03]←D-[A]        ::=  ASP(R03),WR(AB,L,A)
1962    .MACRO A#BSPLO[04]←D-[A]        ::=  ASP(R04),WR(AB,L,A)
1963    .MACRO A#BSPLO[05]←D-[A]        ::=  ASP(R05),WR(AB,L,A)
1964    .MACRO A#BSPLO[06]←D-[A]        ::=  ASP(R06),WR(AB,L,A)
1965    .MACRO A#BSPLO[07]←D-[A]        ::=  ASP(R07),WR(AB,L,A)
1966    .MACRO A#BSPLO[10]←D-[A]        ::=  ASP(R10),WR(AB,L,A)
1967    .MACRO A#BSPLO[11]←D-[A]        ::=  ASP(R11),WR(AB,L,A)
1968    .MACRO A#BSPLO[12]←D-[A]        ::=  ASP(R12),WR(AB,L,A)
1969    .MACRO A#BSPLO[13]←D-[A]        ::=  ASP(R13),WR(AB,L,A)
1970    .MACRO A#BSPLO[14]←D-[A]        ::=  ASP(R14),WR(AB,L,A)
1971    .MACRO A#BSPLO[15]←D-[A]        ::=  ASP(R15),WR(AB,L,A)
1972    .MACRO A#BSPLO[16]←D-[A]        ::=  ASP(R16),WR(AB,L,A)
1973    .MACRO A#BSPLO[17]←D-[A]        ::=  ASP(R17),WR(AB,L,A)
1974
1975    .MACRO A#BSPHI[00]←D-[A]        ::=  ASP(R00),WR(AB,H,A)
1976    .MACRO A#BSPHI[01]←D-[A]        ::=  ASP(R01),WR(AB,H,A)
1977    .MACRO A#BSPHI[02]←D-[A]        ::=  ASP(R02),WR(AB,H,A)
1978    .MACRO A#BSPHI[03]←D-[A]        ::=  ASP(R03),WR(AB,H,A)
1979    .MACRO A#BSPHI[04]←D-[A]        ::=  ASP(R04),WR(AB,H,A)
1980    .MACRO A#BSPHI[05]←D-[A]        ::=  ASP(R05),WR(AB,H,A)
1981    .MACRO A#BSPHI[06]←D-[A]        ::=  ASP(R06),WR(AB,H,A)
1982    .MACRO A#BSPHI[07]←D-[A]        ::=  ASP(R07),WR(AB,H 9)
1983    .MACRO A#BSPHI[10]←D-[A]        ::=  ASP(R10),WR(AB,H,A)
1984    .MACRO A#BSPHI[11]←D-[A]        ::=  ASP(R11),WR(AB,H,A)
1985    .MACRO A#BSPHI[12]←D-[A]        ::=  ASP(R12),WR(AB,H,A)
1986    .MACRO A#BSPHI[13]←D-[A]        ::=  ASP(R13),WR(AB,H,A)
1987    .MACRO A#BSPHI[14]←D-[A]        ::=  ASP(R14),WR(AB,H,A)
1988    .MACRO A#BSPHI[15]←D-[A]        ::=  ASP(R15),WR(AB,H,A)
1989    .MACRO A#BSPHI[16]←D-[A]        ::=  ASP(R16),WR(AB,H,A)
1990    .MACRO A#BSPHI[17]←D-[A]        ::=  ASP(R17),WR(AB,H,A)
1991
1992    .MACRO A#BSPLO[00]←D-[B]        ::=  BSP(R00),WR(AB,L,B)
1993    .MACRO A#BSPLO[01]←D-[B]        ::=  BSP(R01),WR(AB,L,B)
1994    .MACRO A#BSPLO[02]←D-[B]        ::=  BSP(R02),WR(AB,L,B)
1995    .MACRO A#BSPLO[03]←D-[B]        ::=  BSP(R03),WR(AB,L,B)
1996    .MACRO A#BSPLO[04]←D-[B]        ::=  BSP(R04),WR(AB,L,B)
1997    .MACRO A#BSPLO[05]←D-[B]        ::=  BSP(R05),WR(AB,L,B)
1998    .MACRO A#BSPLO[06]←D-[B]        ::=  BSP(R06),WR(AB,L,B)
```

```
1999    .MACRO A#BSPLO[07]←D-[B]        ::=  BSP(R07),WR(AB,L,B)
2000    .MACRO A#BSPLO[10]←D-[B]        ::=  BSP(R10),WR(AB,L,B)
2001    .MACRO A#BSPLO[11]←D-[B]        ::=  BSP(R11),WR(AB,L,B)
2002    .MACRO A#BSPLO[12]←D-[B]        ::=  BSP(R12),WR(AB,L,B)
2003    .MACRO A#BSPLO[13]←D-[B]        ::=  BSP(R13),WR(AB,L,B)
2004    .MACRO A#BSPLO[14]←D-[B]        ::=  BSP(R14),WR(AB,L,B)
2005    .MACRO A#BSPLO[15]←D-[B]        ::=  BSP(R15),WR(AB,L,B)
2006    .MACRO A#BSPLO[16]←D-[B]        ::=  BSP(R16),WR(AB,L,B)
2007    .MACRO A#BSPLO[17]←D-[B]        ::=  BSP(R17),WR(AB,L,B)
2008
2009    .MACRO A#BSPHI[00]←D-[B]        ::=  BSP(R00),WR(AB,H,B)
2010    .MACRO A#BSPHI[01]←D-[B]        ::=  BSP(R01),WR(AB,H,B)
2011    .MACRO A#BSPHI[02]←D-[B]        ::=  BSP(R02),WR(AB,H,B)
2012    .MACRO A#BSPHI[03]←D-[B]        ::=  BSP(R03),WR(AB,H,B)
2013    .MACRO A#BSPHI[04]←D-[B]        ::=  BSP(R04),WR(AB,H,B)
2014    .MACRO A#BSPHI[05]←D-[B]        ::=  BSP(R05),WR(AB,H,B)
2015    .MACRO A#BSPHI[06]←D-[B]        ::=  BSP(R06),WR(AB,H,B)
2016    .MACRO A#BSPHI[07]←D-[B]        ::=  BSP(R07),WR(AB,H,B)
2017    .MACRO A#BSPHI[10]←D-[B]        ::=  BSP(R10),WR(AB,H,B)
2018    .MACRO A#BSPHI[11]←D-[B]        ::=  BSP(R11),WR(AB,H,B)
2019    .MACRO A#BSPHI[12]←D-[B]        ::=  BSP(R12),WR(AB,H,B)
2020    .MACRO A#BSPHI[13]←D-[B]        ::=  BSP(R13),WR(AB,H,B)
2021    .MACRO A#BSPHI[14]←D-[B]        ::=  BSP(R14),WR(AB,H,B)
2022    .MACRO A#BSPHI[15]←D-[B]        ::=  BSP(R15),WR(AB,H,B)
2023    .MACRO A#BSPHI[16]←D-[B]        ::=  BSP(R16),WR(AB,H,B)
2024    .MACRO A#BSPHI[17]←D-[B]        ::=  BSP(R17),WR(AB,H,B)
2025
2026    .MACRO ASPLO[DF]←D              ::=  ASP-ADDRS-R[DF],WR(A,L,A)
2027    .MACRO ASPHI[DF]←D              ::=  ASP-ADDRS-R[DF],WR(A,H,A)
2028    .MACRO BSPLO[DF]←D              ::=  BSP-ADDRS-R[DF],WR(B,L,B)
2029    .MACRO BSPHI[DF]←D              ::=  BSP-ADDRS-R[DF],WR(B,H,B)
2030
2031    .MACRO ASPLO[SF]←D              ::=  ASP-ADDRS-R[SF],WR(A,L,A)
2032    .MACRO ASPHI[SF]←D              ::=  ASP-ADDRS-R[SF],WR(A,H,A)
2033    .MACRO BSPLO[SF]←D              ::=  BSP-ADDRS-R[SF],WR(B,L,B)
2034    .MACRO BSPHI[SF]←D              ::=  BSP-ADDRS-R[SF],WR(B,H,B)
2035
2036    .MACRO A#BSPLO[DF]←D-[A]        ::=  ASP-ADDRS-R[DF],WR(AB,L,A)
2037    .MACRO A#BSPHI[DF]←D-[A]        ::=  ASP-ADDRS-R[DF],WR(AB,H,A)
2038    .MACRO A#BSPLO[DF]←D-[B]        ::=  BSP-ADDRS-R[DF],WR(AB,L,B)
2039    .MACRO A#BSPHI[DF]←D-[B]        ::=  BSP-ADDRS-R[DF],WR(AB,H,B)
2040
2041    .MACRO A#BSPLO[SF]←D-[A]        ::=  ASP-ADDRS-R[SF],WR(AB,L,A)
2042    .MACRO A#BSPHI[SF]←D-[A]        ::=  ASP-ADDRS-R[SF],WR(AB,H,A)
2043    .MACRO A#BSPLO[SF]←D-[B]        ::=  BSP-ADDRS-R[SF],WR(AB,L,B)
2044    .MACRO A#BSPHI[SF]←D-[B]        ::=  BSP-ADDRS-R[SF],WR(AB,H,B)
2045
2046    .MACRO A#BSPLO[SF]←D            ::=  ASP-ADDRS-R[SF],BSP-ADDRS-R[SF],WR(AB,L,A)
2047    .MACRO A#BSPLO[DF]←D            ::=  ASP-ADDRS-R[DF],BSP-ADDRS-R[DF],WR(AB,L,A)
2048    .MACRO A#BSPHI[SF]←D            ::=  ASP-ADDRS-R[SF],BSP-ADDRS-R[SF],WR(AB,H,A)
2049    .MACRO A#BSPHI[DF]←D            ::=  ASP-ADDRS-R[DF],BSP-ADDRS-R[DF],WR(AB,H,A)
2050
2051
2052
```

```
2053    !.PAGE=========================================================================================================================
2054
2055    .TOC    *       D AND SR <- (BUS-A FCN BUS-B), AT P2-T OR P3-T
2056
2057            !LOGIC FUNCTIONS:
2058    .MACRO SR←ZERO                  ::= ZERO,CLK-SR
2059    .MACRO SR←A-XOR-B               ::= A-XOR-B,CLK-SR
2060    .MACRO SR←B                     ::= B,CLK-SR
2061    .MACRO SR←A-AND-B               ::= A-AND-B,CLK-SR
2062    .MACRO SR←A-IOR-B               ::= A-IOR-B,CLK-SR
2063    .MACRO SR←A                     ::= A,CLK-SR
2064    .MACRO SR←NOT-A                 ::= NOT-A,CLK-SR
2065    .MACRO SR←NOT-A-AND-B           ::= NOT-A-AND-B,CLK-SR
2066    .MACRO SR←A-AND-NOT-B           ::= A-AND-NOT-B,CLK-SR
2067    .MACRO D←ZERO                   ::= ZERO,CLK-D
2068    .MACRO D←A-XOR-B                ::= A-XOR-B,CLK-D
2069    .MACRO D←B                      ::= B,CLK-D
2070    .MACRO D←A-AND-B                ::= A-AND-B,CLK-D
2071    .MACRO D←A-IOR-B                ::= A-IOR-B,CLK-D
2072    .MACRO D←A                      ::= A,CLK-D
2073    .MACRO D←NOT-A                  ::= NOT-A,CLK-D
2074    .MACRO D←NOT-A-AND-B            ::= NOT-A-AND-B,CLK-D
2075    .MACRO D←A-AND-NOT-B            ::= A-AND-NOT-B,CLK-D
2076
2077            !ARITH FUNCTIONS:
2078    .MACRO D←DIVIDE-STEP                    ::= DIVIDE,CLK-D
2079    .MACRO D←A-PLUS-B                       ::= A-PLUS-B,CLK-D
2080    .MACRO D←A-PLUS-B-PLUS-0                ::= A-PLUS-B,CLK-D
2081    .MACRO D←A-MINUS-B                      ::= A-MINUS-B,CLK-D
2082    .MACRO D←A-PLUS-B-PLUS-PS[C]            ::= A-PLUS-B-PLUS-PS[C],CLK-D
2083    .MACRO D←A-PLUS-B-PLUS-D[C]             ::= A-PLUS-B-PLUS-D[C],CLK-D
2084    .MACRO D←A-PLUS-NOT-B-PLUS-D[C]         ::= A-PLUS-NOT-B-PLUS-D[C],CLK-D
2085    .MACRO D←A-PLUS-B-PLUS-1                ::= A-PLUS-B-PLUS-1,CLK-D
2086    .MACRO SR←DIVIDE-STEP                   ::= DIVIDE,CLK-SR
2087    .MACRO SR←A-PLUS-B                      ::= A-PLUS-B,CLK-SR
2088    .MACRO SR←A-PLUS-B-PLUS-0               ::= A-PLUS-B,CLK-SR
2089    .MACRO SR←A-MINUS-B                     ::= A-MINUS-B,CLK-SR
2090    .MACRO SR←A-PLUS-B-PLUS-PS[C]           ::= A-PLUS-B-PLUS-PS[C],CLK-SR
2091    .MACRO SR←A-PLUS-B-PLUS-D[C]            ::= A-PLUS-B-PLUS-D[C],CLK-SR
2092    .MACRO SR←A-PLUS-NOT-B-PLUS-D[C]        ::= A-PLUS-NOT-B-PLUS-D[C],CLK-SR
2093    .MACRO SR←A-PLUS-B-PLUS-1               ::= A-PLUS-B-PLUS-1,CLK-SR
2094
2095
2096
2097
2098    .TOC    *       D[C] GETS SET
2099
2100    .MACRO D[C]←CINMUX              ::=  CLK-D,COUT←CIN
2101    .MACRO D[C]←1                   ::=  CLK-D,COUT←CIN             !NEEDS SPECIFIC ALU/---
2102    .MACRO D[C]←0                   ::=  CLK-D,COUT←CIN             !NEEDS SPECIFIC ALU/---
2103    .MACRO D[C]←PS[C]               ::=  CLK-D,COUT←PS[C]
2104    .MACRO D[C]←ALU00               ::=  CLK-D,COUT←ALU00
2105    .MACRO D[C]←ALU07               ::=  CLK-D,COUT←ALU07
2106    .MACRO D[C]←ALU15               ::=  CLK-D,COUT←ALU15
```

```
2107    .MACRO D[C]←COUT07              ::=  CLK-D,COUT←COUT07
2108    .MACRO D[C]←COUT15              ::=  CLK-D,COUT←COUT15
2109    .MACRO D[C]←D[C]                ::=  CLK-D,COUT←D[C]
2110    .MACRO SAVE-D[C]                ::=  CLK-D,COUT←D[C]
2111
2112
2113
2114
2115
2116    .TOC    *     D-REGISTER <- [BBUS = ABUS], BITWISE, AT P2-T OR P3-T
2117
2118            !N.B.:  SHIFT TREE ENABLED SEPARATELY
2119    .MACRO D←D-SHIFTED-XOR-CSPB(XX)                 ::=  A-XOR-B,CSPB(@XX),CLK-D
2120    .MACRO D←D-SHIFTED-XOR-BSPHI(XX)                ::=  A-XOR-B,BSPHI(@XX),CLK-D
2121
2122    .MACRO D←FLTPT-XOR-CSPB(XX)                     ::=  A-XOR-B,FLTPT,CSPB(@XX),CLK-D
2123    .MACRO D←FLTPT-XOR-CSPD(XX)                     ::=  A-XOR-B,FLTPT,CSPD(@XX),CLK-D
2124    .MACRO D←FLTPT-XOR-BSPHI(XX)                    ::=  A-XOR-B,FLTPT,BSPHI(@XX),CLK-D
2125
2126    .MACRO D←SR-XOR-CSPB(XX)                        ::=  A-XOR-B,SR,CSPB(@XX),CLK-D
2127    .MACRO D←SR-XOR-CSPD(XX)                        ::=  A-XOR-B,SR,CSPD(@XX),CLK-D
2128    .MACRO D←SR-XOR-BSPHI(XX)                       ::=  A-XOR-B,SR,BSPHI(@XX),CLK-D
2129
2130    .MACRO D←ASPLO[17]-XOR-CSPD(XX)                 ::=  A-XOR-B,ASPLO(R17),CSPD(@XX),CLK-D
2131    .MACRO D←ASPLO[07]-XOR-BSPHI(XX)                ::=  A-XOR-B,ASPLO(R07),BSPHI(@XX),CLK-D
2132    .MACRO D←ASPLO[05]-XOR-BSPHI(XX)                ::=  A-XOR-B,ASPLO(R05),BSPHI(@XX),CLK-D
2133
2134    .MACRO D←SR-XOR-BSPLO[SF]                       ::=  A-XOR-B,SR,R[SF]-LO-B,CLK-D
2135    .MACRO D←SR-XOR-BSPHI[DF]                       ::=  A-XOR-B,SR,R[DF]-HI-B,CLK-D
2136
2137    .MACRO D←ASPLO[DF]-XOR-BSPHI[SF]                ::=  A-XOR-B,R[DF]-LO-A,R[SF]-HI-B,CLK-D
2138    .MACRO D←ASPHI[SF]-XOR-BSPLO[DF]                ::=  A-XOR-B,R[SF]-HI-A,R[DF]-LO-B,CLK-D
2139
2140    .MACRO D←CSPD[05]-XOR-ASPLO(XX)                 ::=  A-XOR-B,CSPD(D05),ASPLO(@XX),CLK-D
2141    .MACRO D←CSPD[05]-XOR-ASPHI(XX)                 ::=  A-XOR-B,CSPD(D05),ASPHI(@XX),CLK-D
2142    .MACRO D←CSPD[06]-XOR-ASPLO(XX)                 ::=  A-XOR-B,CSPD(D06),ASPLO(@XX),CLK-D
2143    .MACRO D←CSPD[06]-XOR-ASPHI(XX)                 ::=  A-XOR-B,CSPD(D06),ASPHI(@XX),CLK-D
2144    .MACRO D←CSPD[17]-XOR-ASPHI(XX)                 ::=  A-XOR-B,CSPD(D17),ASPHI(@XX),CLK-D
2145
2146    .MACRO D←ASPLO[02]-XOR-BSPLO(XX)                ::=  A-XOR-B,ASPLO(R02),BSPLO(@XX),CLK-D
2147    .MACRO D←ASPLO[03]-XOR-BSPLO(XX)                ::=  A-XOR-B,ASPLO(R03),BSPLO(@XX),CLK-D
2148    .MACRO D←ASPLO[04]-XOR-BSPLO(XX)                ::=  A-XOR-B,ASPLO(R04),BSPLO(@XX),CLK-D
2149    .MACRO D←ASPLO[05]-XOR-BSPLO(XX)                ::=  A-XOR-B,ASPLO(R05),BSPLO(@XX),CLK-D
2150
2151
2152
2153    .TOC    *     D-REGISTER <- D-REGISTER THRU SHIFT-TREE
2154
2155    .MACRO D←D-RIGHT-14             ::=  A,D-RIGHT-14,CLK-D
2156    .MACRO D←D-RIGHT-13             ::=  A,D-RIGHT-13,CLK-D
2157    .MACRO D←D-RIGHT-12             ::=  A,D-RIGHT-12,CLK-D
2158    .MACRO D←D-RIGHT-11             ::=  A,D-RIGHT-11,CLK-D
2159    .MACRO D←D-RIGHT-10             ::=  A,D-RIGHT-10,CLK-D
2160    .MACRO D←D-RIGHT-9              ::=  A,D-RIGHT-9,CLK-D
```

```
2161    .MACRO D←D-RIGHT-8              ::=  A,D-RIGHT-8,CLK-D
2162    .MACRO D←D-RIGHT-7              ::=  A,D-RIGHT-7,CLK-D
2163    .MACRO D←D-RIGHT-6              ::=  A,D-RIGHT-6,CLK-D
2164    .MACRO D←D-RIGHT-5              ::=  A,D-RIGHT-5,CLK-D
2165    .MACRO D←D-RIGHT-4              ::=  A,D-RIGHT-4,CLK-D
2166    .MACRO D←D-RIGHT-3              ::=  A,D-RIGHT-3,CLK-D
2167    .MACRO D←D-RIGHT-2              ::=  A,D-RIGHT-2,CLK-D
2168    .MACRO D←D-RIGHT-1              ::=  A,D-RIGHT-1,CLK-D
2169    .MACRO D←D-NO-SHIFT             ::=  A,D-NO-SHIFT,CLK-D
2170    .MACRO D←D-DIRECT               ::=  A,D-DIRECT,CLK-D
2171    .MACRO D←D                      ::=  A,D-DIRECT,CLK-D
2172    .MACRO SAVE-D                   ::=  A,D-DIRECT,CLK-D
2173    .MACRO D←D-LEFT-1               ::=  A,D-LEFT-1,CLK-D
2174    .MACRO D←D-SWAB                 ::=  A,D-SWAB,CLK-D
2175    .MACRO D←D-SWAB-RIGHT-3         ::=  A,D-SWAB-RIGHT-3,CLK-D
2176    .MACRO D←D-SWAB-LEFT-1          ::=  A,D-SWAB-LEFT-1,CLK-D
2177    .MACRO D←D-SIGNEXT              ::=  A,D-SIGNEXT,CLK-D
2178    .MACRO D←D-SIGNEXT-RIGHT-1      ::=  A,D-SIGNEXT-RIGHT-1,CLK-D
2179    .MACRO D←D-SIGNEXT-LEFT-1       ::=  A,D-SIGNEXT-LEFT-1,CLK-D
2180    .MACRO D←NO-SHIFT               ::=  A,NO-SHIFT,CLK-D
2181    .MACRO D←DIRECT                 ::=  A,DIRECT,CLK-D
2182    .MACRO D←COUNT#D[HI]            ::=  A,COUNT#D[HI],CLK-D
2183    .MACRO D←COUNT#D[LO]            ::=  A,COUNT#D[LO],CLK-D
2184
2185
2186
2187    .TOC   *     D <- WHATEVER'S LEFT, AT P2-T OR P3-T
2188
2189    .MACRO D←NOT-ASPHI(XX)                  ::=  NOT-A,ASPHI(@XX),CLK-D
2190    .MACRO D←NOT-ASPLO(XX)                  ::=  NOT-A,ASPLO(@XX),CLK-D
2191    .MACRO D←NOT-CSPB(XX)                   ::=  A-AND-NOT-B,C177777-A,CSPB(@XX),CLK-D
2192    .MACRO D←NOT-CSPD(XX)                   ::=  A-AND-NOT-B,C177777-A,CSPD(@XX),CLK-D
2193
2194    .MACRO D←CSPD(XX)                       ::=  B,CSPD(@XX),CLK-D
2195    .MACRO D←CSPB(XX)                       ::=  B,CSPB(@XX),CLK-D
2196    .MACRO D←CSPB[16]#D[C]←1                ::=  A-IOR-B,C000000-A,CSPB(B16),CLK-D,D[C]←CINMUX
2197
2198    .MACRO D←BSPHI(XX)                      ::=  B,BSPHI(@XX),CLK-D
2199    .MACRO D←BSPLO(XX)                      ::=  B,BSPLO(@XX),CLK-D
2200    .MACRO D←ASPHI(XX)                      ::=  A,ASPHI(@XX),CLK-D
2201    .MACRO D←ASPLO(XX)                      ::=  A,ASPLO(@XX),CLK-D
2202
2203    .MACRO D←ASPLO[DF]                      ::=  A,R[DF]-LO-A,CLK-D
2204    .MACRO D←ASPHI[DF]                      ::=  A,R[DF]-HI-A,CLK-D
2205    .MACRO D←BSPLO[DF]                      ::=  B,R[DF]-LO-B,CLK-D
2206    .MACRO D←BSPHI[DF]                      ::=  B,R[DF]-HI-B,CLK-D
2207    .MACRO D←ASPLO[SF]                      ::=  A,R[SF]-LO-A,CLK-D
2208    .MACRO D←ASPHI[SF]                      ::=  A,R[SF]-HI-A,CLK-D
2209    .MACRO D←BSPLO[SF]                      ::=  B,R[SF]-LO-B,CLK-D
2210    .MACRO D←BSPHI[SF]                      ::=  B,R[SF]-HI-B,CLK-D
2211
2212    .MACRO D←CSPD[14]-AND-ASPHI(XX)                 ::=  A-AND-B,CSPD(D14),ASPHI(@XX),CLK-D
2213    .MACRO D←CSPD[15]-AND-ASPHI(XX)                 ::=  A-AND-B,CSPD(D15),ASPHI(@XX),CLK-D
2214
```

```
2215    .MACRO SR←ASPHI[17]-AND-007700          ::=  A-AND-B,ASPHI(R17),CSPB(B17),CLK-SR
2216    .MACRO D←SR-IOR-170000                  ::=  A-IOR-B,SR,CSPB(B16),CLK-D
2217    .MACRO SR←ASPHI[17]-AND-000077          ::=  A-AND-B,ASPHI(R17),CSPB(B15),CLK-SR
2218    .MACRO D←SR-IOR-000100                  ::=  A-IOR-B,SR,CSPB(B14),CLK-D
2219
2220    .MACRO D←ASPLO[17]-AND-CSPD(XX)         ::=  A-AND-B,ASPLO(R17),CSPD(@XX),CLK-D
2221    .MACRO D←ASPHI[00]-IOR-CSPD(XX)         ::=  A-IOR-B,ASPHI(R00),CSPD(@XX),CLK-D
2222    .MACRO D←ASPHI[00]-IOR-CSPB(XX)         ::=  A-IOR-B,ASPHI(R00),CSPB(@XX),CLK-D
2223
2224    .MACRO D←SR                             ::=  A,SR,CLK-D
2225    .MACRO D←ALL-ONES                       ::=  A,C177777-A,CLK-D
2226    .MACRO D←D-PLUS-1                       ::=  A-PLUS-B,D-DIRECT,C000001-B,CLK-D
2227    .MACRO D←JUNK                           ::=  ZERO,CLK-D
2228    .MACRO D←TWO                            ::=  A-PLUS-B,C000001-A,C000001-B,CLK-D
2229
2230
2231
2232    !.PAGE=========================================================================================================
2233
2234    .TOC    *     SR <- DATA, AT P2 T OR P3 T
2235
2236            !N.B.:  THE PARTICULAR FUNCTION SELECTED REQUIRES THE RESIDUAL
2237            !       CONTROL REGISTER ("RES-REG") TO HAVE THE APPROPRIATE
2238            !       FUNCTION SETUP FOR THE SR OPERATION.
2239            !
2240            !       POSSIBLE FUNCTIONS:  LOAD, LEFT, RIGHT, NOP
2241
2242    .MACRO SR←ASPHI(XX)                     ::=  A,ASPHI(@XX),CLK-SR
2243    .MACRO SR←NOT-ASPHI(XX)                 ::=  NOT-A,ASPHI(@XX),CLK-SR
2244    .MACRO SR←CSPB(XX)                      ::=  B,CSPB(@XX),CLK-SR
2245    .MACRO SR←CSPD(XX)                      ::=  B,CSPD(@XX),CLK-SR
2246    .MACRO SR←NOT-BSPHI(XX)                 ::=  A-AND-NOT-B,BSPHI(@XX),C177777-A,CLK-SR
2247    .MACRO SR←BSPHI(XX)                     ::=  B,BSPHI(@XX),CLK-SR
2248    .MACRO SR←SR-PLUS-1                     ::=  A-PLUS-B,C000001-B,SR,CLK-SR
2249    .MACRO SR←ALL-ONES                      ::=  A,C177777-A,CLK-SR
2250    .MACRO SR←NOT-CSPB(XX)                  ::=  A-AND-NOT-B,C177777-A,CSPB(@XX),CLK-SR
2251    .MACRO SR←NOT-CSPD(XX)                  ::=  A-AND-NOT-B,C177777-A,CSPD(@XX),CLK-SR
2252    .MACRO SR←SR-RIGHT-1                    ::=  D-DIRECT[BMUX],CLK-SR
2253    .MACRO SR←SR-LEFT-1                     ::=  CLK-SR
2254    .MACRO SR←JUNK                          ::=  ZERO,CLK-SR
2255    .MACRO SR←D                             ::=  A,D-DIRECT,CLK-SR
2256    .MACRO SR←ASPLO[DF]                     ::=  A,R[DF]-LO-A,CLK-SR
2257    .MACRO SR←ASPHI[DF]                     ::=  A,R[DF]-HI-A,CLK-SR
2258    .MACRO SR←BSPLO[DF]                     ::=  B,R[DF]-LO-B,CLK-SR
2259    .MACRO SR←BSPHI[DF]                     ::=  B,R[DF]-HI-B,CLK-SR
2260    .MACRO SR←ASPLO[SF]                     ::=  A,R[SF]-LO-A,CLK-SR
2261    .MACRO SR←ASPHI[SF]                     ::=  A,R[SF]-HI-A,CLK-SR
2262    .MACRO SR←BSPLO[SF]                     ::=  B,R[SF]-LO-B,CLK-SR
2263    .MACRO SR←BSPHI[SF]                     ::=  B,R[SF]-HI-B,CLK-SR
2264
2265
2266
2267
2268
```

```
2269    .TOC   *     RES-REG OPERATION MACROS
2270
2271    .MACRO RES←CSPD(XX)             ::=  CSPD(@XX),LOAD-RES
2272    .MACRO RES←CSPB(XX)             ::=  CSPB(@XX),LOAD-RES
2273
2274
2275
2276
2277
2278    .TOC   *     BASE MACHINE COUNTER
2279
2280    .MACRO COUNTER←CSPD(XX)         ::=  LOAD-COUNTER,CSPD(@XX)
2281    .MACRO COUNTER←BSPHI(XX)        ::=  LOAD-COUNTER,BSPHI(@XX)
2282
2283
2284
2285
2286    .TOC   *     ENABLE ON BUS-A/B ONLY
2287
2288    .MACRO BUS-A←ASPLO[SF]          ::=  R[SF]-LO-A
2289    .MACRO BUS-A←ASPLO[DF]          ::=  R[DF]-LO-A
2290    .MACRO BUS-A←ASPHI[SF]          ::=  R[SF]-HI-A
2291    .MACRO BUS-A←ASPHI[DF]          ::=  R[DF]-HI-A
2292    .MACRO BUS-A                    ::=  NULL
2293    .MACRO BUS-A←ASPLO(XX)          ::=  ASPLO(@XX)
2294    .MACRO BUS-A←ASPHI(XX)          ::=  ASPHI(@XX)
2295    .MACRO BUS-A←SR                 ::=  SR
2296    .MACRO BUS-A←FLTPT              ::=  FLTPT
2297
2298    .MACRO BUS-B←BSPLO[SF]          ::=  R[SF]-LO-B
2299    .MACRO BUS-B←BSPLO[DF]          ::=  R[DF]-LO-B
2300    .MACRO BUS-B←BSPHI[SF]          ::=  R[SF]-HI-B
2301    .MACRO BUS-B←BSPHI[DF]          ::=  R[DF]-HI-B
2302    .MACRO BUS-B                    ::=  NULL
2303    .MACRO BUS-B←BSPLO(XX)          ::=  BSPLO(@XX)
2304    .MACRO BUS-B←BSPHI(XX)          ::=  BSPHI(@XX)
2305    .MACRO BUS-B←CSPD(XX)           ::=  CSPD(@XX)
2306    .MACRO BUS-B←CSPB(XX)           ::=  CSPB(@XX)
2307
2308
2309
2310
2311
2312    .TOC   *     LOADING BA REGISTER
2313    !LOADED AT P1-T ONLY, FROM BUS-B<01:00>#BUS-A<15:00> -> BA<17:00>
2314
2315    .MACRO BA←BSPLO(XX)             ::=  CLK-BA,BSPLO(@XX)
2316    .MACRO BA←BSPHI(XX)             ::=  CLK-BA,BSPHI(@XX)
2317    .MACRO BA←SR                    ::=  CLK-BA,SR
2318    .MACRO BA←ASPLO(XX)             ::=  CLK-BA,ASPLO(@XX)
2319    .MACRO BA←ASPHI(XX)             ::=  CLK-BA,ASPHI(@XX)
2320
2321
2322
```

```
2323
2324
2325    .TOC   *     D AND SR TOGETHER
2326
2327    .MACRO, SR#D←SR-PLUS-CSPD(XX)   ::=  A-PLUS-B,SR,CSPD(@XX),CLK-D,CLK-SR
2328
2329
2330
2331    !.PAGE=========================================================================================================
2332
2333    .TOC   *     UCON FUNCTIONS
2334
2335
2336
2337    .TOC   *       PROCESSOR UCON FUNCTIONS
2338
2339          !PREVIOUSLY SET UP [UCON-PROC, SET-UCON-CONTROL, EN "FUNCTION"]
2340    .MACRO IR←EMIT                    ::=  UCON-OPERATION
2341    .MACRO PS[15-12]←D[15#13]         ::=  UCON-OPERATION
2342    .MACRO FLAG[8-0]←D[15-8]          ::=  UCON-OPERATION
2343    .MACRO FPS[7-4]←D[7-4]            ::=  UCON-OPERATION
2344    .MACRO PS[7-4]←D[7-4]             ::=  UCON-OPERATION
2345    .MACRO PS[3-0]←D[3-0]             ::=  UCON-OPERATION
2346    .MACRO PS←D                       ::=  UCON-OPERATION
2347    .MACRO UBREAK←BUSDIN[11-00]       ::=  UCON-OPERATION
2348
2349          !SETUP UCON AND EXECUTE IN 1 MICROWORD:
2350    .MACRO PS[15-12]←D[15#13]-[I]  ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,EN-CLK-PS[15-12]
2351    .MACRO FLAG[8-0]←D[15-8]-[I]   ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,EN-CLK-FLAG[8-0]
2352    .MACRO FPS[7-4]←D[7-4]-[I]     ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,EN-CLK-FPS[7-4]
2353    .MACRO PS[7-4]←D[7-4]-[I]      ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,EN-CLK-PS[7-4]
2354    .MACRO PS[3-0]←D[3-0]-[I]      ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,EN-CLK-PS[3-0]
2355    .MACRO PS←D-[I]                ::=  UCON-PROC,SET-UCON-CONTROL,UCON-OPERATION,
2356                                           EN-CLK-PS[15-12],EN-CLK-PS[7-4],EN-CLK-PS[3-0]
2357    .MACRO BUSDIN←CUA-[I]          ::=  UCON-PROC,SET-UCON-CONTROL,BUSDIN←CUA[14-03]
2358    .MACRO BUSDIN←FLAGS#FPS-[I]    ::=  UCON-PROC,SET-UCON-CONTROL,BUSDIN←FLAG[8-0]#FPS[7-0]
2359    .MACRO BUSDIN←PS-[I]           ::=  UCON-PROC,SET-UCON-CONTROL,BUSDIN←PS[15-00]
2360    .MACRO BUSDIN←EMIT-[I]         ::=  UCON-PROC,SET-UCON-CONTROL,BUSDIN←EMIT[15-00]
2361
2362
2363
2364    .TOC   *       CACHE/KT UCON FUNCTIONS
2365
2366          !SETUP, EXECUTE IN 1 MICROWORD
2367    .MACRO KT-NO-RELOCATE-[I]              ::=  UCON-CACHE-KT,SET-UCON-CONTROL,EN-KT-NO-RELOCATE
2368    .MACRO BUSDIN←BUS-INTERNAL-ADDR-[I]    ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←BUS-INTERNAL-ADDR[15-00]
2369    .MACRO BUSDIN←CPU-INTERNAL-ADDR-[I]    ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←CPU-INTERNAL-ADDR[15-00]
2370    .MACRO BUSDIN←MMR2-[I]                 ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←MMR2[15-00]
2371    .MACRO BUSDIN←CACHE-STATUS-[I]         ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←CACHE-STATUS[15-00]
2372    .MACRO BUSDIN←SLR#CCR-[I]              ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←KT-SEL,KT-SEL-SLR#CCR
2373    .MACRO BUSDIN←MMR0-[I]                 ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←KT-SEL,KT-SEL-MMR0
2374    .MACRO BUSDIN←PDR-[I]                  ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←KT-SEL,KT-SEL-PDR
2375    .MACRO BUSDIN←PAR-[I]                  ::=  UCON-CACHE-KT,SET-UCON-CONTROL,BUSDIN←KT-SEL,KT-SEL-PAR
2376    .MACRO SLR[15-08]←D[15-08]-[I]         ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-SLR#CCR,KT-WRITE-HIGH
```

```
2377    .MACRO CCR[07-02]←D[07-02]-[I]          ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-SLR#CCR,KT-WRITE-LOW
2378    .MACRO MMR0←D-[I]                       ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-MMR0,KT-WRITE
2379    .MACRO MMR0[00]←D[00]-[I]               ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-MMR0,KT-WRITE-LOW
2380    .MACRO MMR0[15-01]←D[15-01]-[I]         ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-MMR0,KT-WRITE-HIGH
2381    .MACRO PDR←D-[I]                        ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PDR,KT-WRITE
2382    .MACRO PDR[03-01]←D[03-01]-[I]          ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PDR,KT-WRITE-LOW
2383    .MACRO PDR[14-08]←D[14-08]-[I]          ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PDR,KT-WRITE-HIGH
2384    .MACRO PAR←D-[I]                        ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PAR,KT-WRITE
2385    .MACRO PAR[07-00]←D[07-00]-[I]          ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PAR,KT-WRITE-LOW
2386    .MACRO PAR[11-08]←D[11-08]-[I]          ::=  UCON-CACHE-KT,SET-UCON-CONTROL,UCON-OPERATION,KT-SEL-PAR,KT-WRITE-HIGH
2387
2388
2389
2390    .TOC    *       I-0 UCON FUNCTIONS
2391
2392            !N.B.:  SETUP IN 1 MICROWORD
2393    .MACRO BUSDIN←JAM-[I]               ::=  UCON-I-0,EN-STATUS-MUX,SET-UCON-CONTROL,BUSDIN←JAM[15-00]
2394    .MACRO BUSDIN←SERVICE-[I]           ::=  UCON-I-0,EN-STATUS-MUX,SET-UCON-CONTROL,BUSDIN←SERVICE[15-00]
2395    .MACRO BUSDIN←PBA-[I]               ::=  UCON-I-0,EN-STATUS-MUX,SET-UCON-CONTROL,BUSDIN←PBA[15-00]
2396    .MACRO BC-FCN-0-[I]                 ::=  UCON-I-0,SET-UCON-CONTROL,UCON-OPERATION,EN-BC-FCN-0
2397    .MACRO START-DELAY-[I]              ::=  UCON-I-0,SET-UCON-CONTROL,UCON-OPERATION,EN-START-DELAY
2398    .MACRO CLR-JAM-ERRORS-[I]           ::=  UCON-I-0,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-JAM-ERRORS
2399    .MACRO CLR-NPR-TIMEOUT-[I]          ::=  UCON-I-0,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-NPR-TIMEOUT
2400    .MACRO CLR-PWR-FAIL-[I]             ::=  UCON-I-0,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-PWR-FAIL
2401    .MACRO CLR-YELLOW-ZONE-[I]          ::=  UCON-I-0,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-YELLOW-ZONE
2402    .MACRO ALLOW-BG[1]H-[I]             ::=  UCON-I-0,SET-UCON-CONTROL,UCON-OPERATION,EN-ALLOW-BG[1]H
2403    .MACRO BUS-INIT-UCON-[I]            ::=  UCON-I-0,SET-UCON-CONTROL,UCON-OPERATION,EN-BUS-INIT-UCON
2404
2405
2406    .TOC    *       DCS UCON FUNCTIONS
2407
2408            !SETUP IN 1 MICROWORD:
2409    .MACRO BUSDIN←TNUA-[I]              ::=  UCON-DCS,SET-UCON-CONTROL,BUSDIN←TNUA[11-00]
2410    .MACRO BUSDIN←ERROR-CODE-[I]        ::=  UCON-DCS,SET-UCON-CONTROL,BUSDIN←ERR#EOP#ERRCOD[11-00]
2411
2412
2413    .TOC    *       CONSOLE UCON FUNCTIONS
2414
2415            !SETS UP AND PERFORMS INDICATED OPERATION IN 1 MICROWORD
2416    .MACRO CONSOLE-NOP                      ::=  UCON-I-0,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-CNSL-NOP
2417    .MACRO CLEAR-CONSOLE-COUNTER            ::=  UCON-I-0,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-COUNTR
2418    .MACRO INCREMENT-CONSOLE-COUNTER        ::=  UCON-I-0,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-INCR-COUNTR
2419    .MACRO CLEAR-CONSOLE-SERVICE            ::=  UCON-I-0,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-CNSL-SRVC
2420    .MACRO STROBE-CONSOLE-DISPLAY           ::=  UCON-I-0,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-STRB-DISP
2421    .MACRO CLEAR-CONSOLE-LED                ::=  UCON-I-0,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-CLR-CNSL
2422    .MACRO SET-CONSOLE-LED                  ::=  UCON-I-0,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-SET-CNSL
2423    .MACRO SET-CONSOLE-DP-LEDS              ::=  UCON-I-0,EN-CONSOLE-COMMAND,SET-UCON-CONTROL,UCON-OPERATION,EN-SET-DP
2424    .MACRO BUSDIN←CONSOLE-[I]               ::=  UCON-I-0,EN-STATUS-MUX,SET-UCON-CONTROL,BUSDIN←CONSOLE[06-00]
2425
2426
2427
2428    .TOC    *       DBUF UCON FUNCTIONS
2429
2430            !PREVIOUSLY SETUP UCON-I-0, EN LOAD DBUF
```

```
2431    .MACRO DBUF←D                   ::=  UCON-OPERATION
2432
2433          !SETUP AND EXECUTE IN 1 MICROWORD:
2434    .MACRO DBUF←D-[I]               ::=  UCON-I-0,SET-UCON-CONTROL,UCON-OPERATION,EN-LOAD-DBUF[15-00]
2435
2436
2437    .TOC   *       MULTIPLE UCON FUNCTIONS
2438
2439          !THESE ARE FUNCTIONS OF MORE THAN 1 UCON ENABLED SIMULTANEOUSLY
2440
2441          !PREVIOUSLY SETUP:
2442    .MACRO IR←DBUF                  ::=  UCON-OPERATION
2443
2444          !SETUP AND EXECUTE IN 1 MICROWORD:
2445    .MACRO IR←DBUF-[I]              ::=  UCON-PROC,UCON-I-0,SET-UCON-CONTROL,
2446                                            UCON-OPERATION,EN-CLK-IR[15-00],BUSDIN←DBUF[15-00]
2447
2448
2449
2450    !.PAGE=========================================================================================================
2451
2452    .TOC   *     SPECIFIC MACROS FOR PREFETCH/OVERLAP/SP-INHIBIT TESTS
2453
2454    .MACRO CSPD[17]←020010          ::=  EMIT/020010,CSPD[17]←EMIT
2455    .MACRO A#BSPLO[OVERLAP]←D       ::=  ASPLO(R10),WR(AB,L,A)
2456    .MACRO A#BSPHI[PATTERN]←D       ::=  ASPHI(R17),WR(AB,H,A)
2457    .MACRO A#BSPHI[PREFETCH]←D      ::=  ASPHI(R10),WR(AB,H,A)
2458    .MACRO ASPLO[OVERLAP]←D         ::=  ASPLO(R10),WR(A,L,A)
2459    .MACRO BSPLO[OVERLAP]←D         ::=  BSPLO(R10),WR(B,L,B)
2460    .MACRO ASPHI[PREFETCH]←D        ::=  ASPHI(R10),WR(A,H,A)
2461
2462    .MACRO D←ASPLO[OVERLAP]-PLUS-1          ::=  A-PLUS-B,ASPLO(R10),C000001-B,CLK-D
2463    .MACRO D←BSPLO[OVERLAP]-PLUS-1          ::=  A-PLUS-B,BSPLO(R10),C000001-A,CLK-D
2464    .MACRO D←ASPHI[PREFETCH]-PLUS-1         ::=  A-PLUS-B,ASPHI(R10),C000001-B,CLK-D
2465    .MACRO D←ASPHI[PATTERN]-PLUS-020010-PLUS-1      ::=  A-PLUS-B-PLUS-1,ASPHI(R17),CSPB(B17),CLK-D
2466    .MACRO D←ASPHI[PATTERN]-AND-NOT-020010          ::=  A-AND-NOT-B,ASPHI(R17),CSPB(B17),CLK-D
2467
2468    .MACRO D←BSPHI[PREFETCH]                ::=  B,BSPHI(R10),CLK-D
2469    .MACRO D←ASPLO[OVERLAP]-MINUS-CSPB[EXPEC]       ::=  A-MINUS-B,ASPLO(R10),CSPB(B17),CLK-D
2470    .MACRO D←ASPHI[PREFETCH]-MINUS-CSPB[EXPEC]      ::=  A-MINUS-B,ASPHI(R10),CSPB(B17),CLK-D
2471    .MACRO D←ASPLO[OVERLAP]-MINUS-BSPLO[OVERLAP]    ::=  A-MINUS-B,ASPLO(R10),BSPLO(R10),CLK-D
2472
2473    .MACRO CSPD[EXPEC]←EMIT                 ::=  CSPD[17]←EMIT
2474
2475
2476
2477    !.PAGE=========================================================================================================
2478
2479    .TOC   *     SPECIFIC MACROS FOR BYTE/BYTE CONSTANT/D=ZERO TESTS
2480
2481    .MACRO D←ASPLO[DNONZERO]-PLUS-1         ::=  A-PLUS-B,ASPLO(R11),C000001-B,CLK-D
2482    .MACRO D←BSPLO[DZERO]-PLUS-1            ::=  A-PLUS-B,C000001-A,BSPLO(R11),CLK-D
2483    .MACRO D←BSPLO[IR-DATA]-PLUS-2          ::=  A-PLUS-B-PLUS-1,C000001-A,BSPLO(R10),CLK-D
2484    .MACRO D←BSPHI[WORD]-PLUS-1             ::=  A-PLUS-B,C000001-A,BSPHI(R10),CLK-D
```

```
2485    .MACRO D+BSPLO[IR-DATA]                 ::=  B,BSPLO(R10),CLK-D
2486    .MACRO D+BSPLO[DZERO]                   ::=  B,BSPLO(R11),CLK-D
2487    .MACRO D+SR-MINUS-BSPHI[WORD]           ::=  A-MINUS-B,SR,BSPHI(R10),CLK-D,P3-T
2488    .MACRO D+ASPLO[DNONZERO]-MINUS-CSPD[17]      ::=  A-MINUS-B,ASPLO(R11),CSPD(D17),CLK-D,P3-T
2489    .MACRO D+ASPHI[BYTE-FIRST]-MINUS-CSPD[17]    ::=  A-MINUS-B,ASPHI(R10),CSPD(D17),CLK-D,P3-T
2490    .MACRO D+ASPLO[BYTE-SECOND]-MINUS-CSPD[17]   ::=  A-MINUS-B,ASPLO(R10),CSPD(D17),CLK-D,P3-T
2491    .MACRO D+ASPHI[BYTE-FIRST]-PLUS-CSP[1-0]     ::=  A-PLUS-B,ASPHI(R10),CSPD(D13),CLK-D
2492    .MACRO D+ASPLO[BYTE-SECOND]-PLUS-CSP[1-0]    ::=  A-PLUS-B,ASPLO(R10),CSPD(D13),CLK-D
2493
2494
2495
2496    !.PAGE=============================================================================================================
2497
2498    .TOC   *     SUBROUTINE CALL MACROS
2499
2500    .MACRO CALL[DISPLAY]            ::=  GOTO-PAGE(7),J/DISPLAY
2501
2502    .MACRO CALL[DINTOIR]            ::=  GOTO-PAGE(7),J/DINTOIR
2503    .MACRO CALL[DINTOIR-5]          ::=  GOTO-PAGE(7),J/DINTOIR5
2504    .MACRO CALL[SRINTOIR]           ::=  GOTO-PAGE(7),J/SRINTOIR
2505    .MACRO CALL[SRINTOIR-5]         ::=  GOTO-PAGE(7),J/SRINTOIR5
2506
2507    .MACRO CALL[FLAGFPSTOD]         ::=  GOTO-PAGE(7),J/FLAGFPSTOD
2508    .MACRO CALL[PSTOD]              ::=  GOTO-PAGE(7),J/PSTOD
2509    .MACRO CALL[CUATOD]             ::=  GOTO-PAGE(7),J/CUATOD
2510    .MACRO CALL[CLRJAMTOD]          ::=  GOTO-PAGE(7),J/CLRJAMTOD
2511    .MACRO CALL[ODDJAMTOD]          ::=  GOTO-PAGE(7),J/ODDJAMTOD
2512    .MACRO CALL[JAMTOD]             ::=  GOTO-PAGE(7),J/JAMTOD
2513    .MACRO CALL[CLRSERVICETOD]      ::=  GOTO-PAGE(7),J/CLRSERVICETOD
2514    .MACRO CALL[DATISERVICETOD]     ::=  GOTO-PAGE(7),J/DATISERVICETOD
2515    .MACRO CALL[DATOSERVICETOD]     ::=  GOTO-PAGE(7),J/DATOSERVICETOD
2516    .MACRO CALL[CJESERVICETOD]      ::=  GOTO-PAGE(7),J/CJESERVICETOD
2517    .MACRO CALL[SERVICETOD]         ::=  GOTO-PAGE(7),J/SERVICETOD
2518    .MACRO CALL[PBATOD]             ::=  GOTO-PAGE(7),J/PBATOD
2519    .MACRO CALL[PSSEQLOD]           ::=  GOTO-PAGE(7),J/PSSEQLOD
2520    .MACRO CALL[FLAGFPSSEQLOD]      ::=  GOTO-PAGE(7),J/FLAGFPSSEQLOD
2521    .MACRO CALL[FLAGLOD]            ::=  GOTO-PAGE(7),J/FLAGFPS03
2522    .MACRO CALL[GETPROCDAT]         ::=  GOTO-PAGE(7),J/GETPROCDAT
2523
2524    .MACRO CALL[CLEAR-I-0-A]        ::=  GOTO-PAGE(7),J/CLEAR-I-0-A
2525    .MACRO CALL[CLEAR-I-0-B]        ::=  GOTO-PAGE(7),J/CLEAR-I-0-B
2526
2527    .MACRO CALL[BUSDINXOR125252]    ::=  GOTO-PAGE(7),J/BDX12
2528    .MACRO CALL[BUSDINXOR052525]    ::=  GOTO-PAGE(7),J/BDX05
2529    .MACRO CALL[CSP17XOR125252]     ::=  GOTO-PAGE(7),J/C17X12
2530    .MACRO CALL[CSP17XOR052525]     ::=  GOTO-PAGE(7),J/C17X05
2531
2532    .MACRO CALL[D15-12]             ::=  GOTO-PAGE(7),J/D[15-12]
2533    .MACRO CALL[D11-06]             ::=  GOTO-PAGE(7),J/D[11-06]
2534    .MACRO CALL[D05-00]             ::=  GOTO-PAGE(7),J/D[05-00]
2535    .MACRO CALL[DZERO]              ::=  GOTO-PAGE(7),J/DZERO
2536
2537    .MACRO CALL[ZEROSF04DF02]       ::=  GOTO-PAGE(7),J/ZEROSF04DF02
2538    .MACRO CALL[ZEROSF02DF04]       ::=  GOTO-PAGE(7),J/ZEROSF02DF04
```

```
2539    .MACRO CALL[ZEROSFDF]           ::=  GOTO-PAGE(7),J/ZEROSFDF
2540    .MACRO CALL[ZERODF]             ::=  GOTO-PAGE(7),J/ZERODF
2541
2542    .MACRO CALL[SFDFTOSR]           ::=  GOTO-PAGE(5),J/SFDFTOSR
2543
2544    .MACRO CALL[ALUCARRY1]          ::=  GOTO-PAGE(7),J/ALUCARRY1
2545    .MACRO CALL[ALUCARRY2]          ::=  GOTO-PAGE(7),J/ALUCARRY2
2546
2547    .MACRO CALL[LOADFPSCC]          ::=  GOTO-PAGE(7),J/LOADFPSCC
2548    .MACRO XFR-TO-BM[LOADNZW4]      ::=  GOTO-PAGE(4),J/LOADNZW4
2549
2550    .MACRO CALL[SETUPPSCC#DC]       ::=  GOTO-PAGE(7),J/SETUPPSCC#DC
2551    .MACRO CALL[PSCCTOSR3-0]        ::=  GOTO-PAGE(7),J/PSCCTOSR3-0
2552
2553    .MACRO CALL[CSP16XORSRTOIR-5]   ::=  GOTO-PAGE(7),J/CSP16XORSRTOIR5
2554    .MACRO CALL[CSP16XORFLTTOIR-5]  ::=  GOTO-PAGE(7),J/CSP16XORFLTTOIR5
2555
2556    .MACRO CALL[MFSS-TEST]          ::=  GOTO-PAGE(6),J/MFSS01
2557
2558    .MACRO CALL[KTSRCDST]           ::=  GOTO-PAGE(7),J/KTSRCDST01
2559    .MACRO CALL[KTDSTBSP]           ::=  GOTO-PAGE(7),J/KTSRCDST08
2560    .MACRO CALL[KTSRCBSP]           ::=  GOTO-PAGE(7),J/KTSRCDST07
2561
2562    .MACRO CALL[COUNT-TEST]         ::=  GOTO-PAGE(4),J/COUNTER01
2563
2564
2565
2566    !.PAGE=============================================================================================================
2567
2568    .TOC    *      JAM UPP LOG MACROS
2569
2570            !MACROS CONCERNED WITH CSP LOG AFTER UNEXPECTED JAMUPP
2571            !MACROS REQUIRE APPROPRIATE REGISTER ENABLED ON BUSDIN
2572
2573    .MACRO CSPD[00]←LOG-CUA         ::=  CSPD(D00),WR-CSP
2574    .MACRO CSPD[01]←LOG-SERVICE     ::=  CSPD(D01),WR-CSP
2575    .MACRO CSPD[02]←LOG-JAM         ::=  CSPD(D02),WR-CSP
2576
2577
2578
2579    !*****  END OF MACRO DEFINITIONS  *****
2580
2581
2582
2583    !.PAGE=============================================================================================================
2584
2585    .TOC    * - - -  MICRODIAGNOSTIC CODE - - - - - - - - - - - - - - - - - - - -
2586
2587    .CODE
2588
2589
2590
2591
2592
```

```
2593
2594
2595    !.PAGE=========================================================================================================
2596
2597    !*** VERSION /V101A0/ ***
2598
2599    !***** MICRODIAGNOSTIC INITIAL STARTUP LOCATION *****
2600
2601
2602    .TOC   *   TEST001-007:  NUA SEQUENCING
2603
2604    !*************************************************************************************
2605    !*
2606    !*      TESTS:  001 - 007                                    UWORDS: 010 + 000
2607    !*
2608    !*      FUNCTIONS:       TESTS 001 - 007 TEST THE NUA SEQUENCING LOGIC.
2609    !*                              PATTERNS ARE RUN THRU THE NUA LOGIC ESTABLISHING
2610    !*                              THAT ALL BITS CAN BE SET AND CLEARED, AND THAT THE
2611    !*                              STATE [SET, CLEARED] OF NO ONE BIT AFFECTS THE
2612    !*                              ABILITY TO SET/CLEAR ANY OTHER BIT.  THE PAGE
2613    !*                              CHANGING FUNCTIONS OF BUTA(SUBR-A) AND BUTA(SUBR-B)
2614    !*                              ARE ALSO TESTED FOR PAGES 4, 5, 6, & 7.  NOTE
2615    !*                              THAT THE RETURN ADDRESS SIMULTANEOUSLY LOADED
2616    !*                              IS NOT CHECKED FOR VALIDITY AT THIS POINT.
2617    !*
2618    !*      NOTES:  TEST[N] DOES THE SETUP FOR TEST[N+1].  THE ACTUAL TEST CONSISTS
2619    !*              OF BEING IN THE RIGHT PLACE (MICROWORD) AT THE RIGHT TIME.
2620    !*
2621    !*************************************************************************************
2622
2623
2624
2625
2626
2627
2628    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
2629
2630    !*** TEST 001 ***
2631    !TEST   NUA LOGIC   WITH PATTERN "100 000 000 000"
2632    4000:
2633    TEST001:
2634            PO,     LOAD-ENUA(6252),                        !LOAD ENUA WITH ADDR[NEXT UWORD]
2635                    LOAD-ERROR(TEST001),                    !ERROR DIRECTORY KEY
2636                    DCS-CTR(C1.),                           !COMPARE AT NEXT UWORD
2637            NEXT,   PAGE(2), BUTA(SUBR-B),                  !CHANGING TO PAGE 2 (ACTUALLY 6), VIA SUBR-B
2638                    J/TEST002                               !NOTE OVERLAP:  NEXTPAGE<2:0>=ENUA<2:0>
    (4000)  DCS[1.00.1.0.0.0]  BM[1110..00.11..00.10..101..010...0.0.0...0..0...0.0000...0..0000.0...11.100...010.101.010]
2639                                                            !NOTE ALSO DCS MODULE FORCES NUA<11>=1, SO
2640                                                            !PAGES 2/6 ARE EQUIVALENT REFERENCES.
2641
2642
2643
```

```
2644
2645
2646
2647
2648
2649    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
2650
2651    !*** TEST 002 ***
2652    !TEST   NUA LOGIC   WITH PATTERN "010 010 101 010"
2653    6252:
2654    TEST002:
2655            PO,     LOAD-ENUA(6631),                        !LOAD ENUA WITH ADDR[NEXT UWORD]
2656                    LOAD-ERROR(TEST002),                    !ERROR DIRECTORY KEY
2657                    DCS-CTR(C1.),                           !COMPARE AT NEXT UWORD
2658                    BUMP-VERIFY,                            !COUNT
2659            NEXT,   J/TEST003                               !
    (6252)  DCS[1.00.1.0.0.1]  BM[1110..00.11..01.10..011..001...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.001]
2660
2661
2662
2663
2664
2665
2666
2667
2668    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
2669
2670    !*** TEST 003 ***
2671    !TEST   NUA LOGIC   WITH PATTERN "010 110 011 001"
2672    6631:
2673    TEST003:
2674            PO,     LOAD-ENUA(5525),                        !LOAD ENUA WITH ADDR[NEXT UWORD]
2675                    LOAD-ERROR(TEST003),                    !ERROR DIRECTORY KEY
2676                    DCS-CTR(C1.),                           !COMPARE AT NEXT UWORD
2677            NEXT,   PAGE(5), BUTA(SUBR-A),                  !CHANGING TO PAGE 5, VIA SUBR-A
2678                    J/TEST004                               !NOTE OVERLAP:  NEXTPAGE<2:0>=ENUA<2:0>
    (6631)  DCS[1.00.1.0.0.0]  BM[1110..00.10..11.01..010..101...0.0.0..0..0...0.0000...0..0000.0...11.101...101.010.101]
2679
2680
2681
2682
2683
2684
2685
2686
2687    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
2688
2689    !*** TEST 004 ***
2690    !TEST   NUA LOGIC   WITH PATTERN "101 101 010 101"
2691    5525:
2692    TEST004:
2693            PO,     LOAD-ENUA(5146),                        !LOAD ENUA WITH ADDR[NEXT UWORD]
2694                    LOAD-ERROR(TEST004),                    !ERROR DIRECTORY KEY
```

```
2695                    DCS-CTR(C1.),                           !COMPARE AT NEXT UWORD
2696                    BUMP-VERIFY,                            !COUNT
2697            NEXT,   J/TEST005                               !
    (5525)  DCS[1.00.1.0.0.1]  BM[1110..00.10..10.01..100..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.110]
2698
2699
2700
2701
2702
2703
2704
2705
2706    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
2707
2708    !*** TEST 005 ***
2709    !TEST   NUA LOGIC   WITH PATTERN "101 001 100 110"
2710    5146:
2711    TEST005:
2712            PO,     LOAD-ENUA(4474),                        !LOAD ENUA WITH ADDR[NEXT UWORD]
2713                    LOAD-ERROR(TEST005),                    !ERROR DIRECTORY KEY
2714                    DCS-CTR(C1.),                           !COMPARE AT NEXT UWORD
2715            NEXT,   PAGE(4), BUTA(SUBR-B),                  !CHANGING TO PAGE 4, VIA SUBR-B
2716                    J/TEST006                               !NOTE OVERLAP:  NEXTPAGE<2:0>=ENUA<2:0>
    (5146)  DCS[1.00.1.0.0.0]  BM[1110..00.10..01.00..111..100...0.0.0..0..0...0.0000...0..0000.0...11.100...100.111.100]
2717
2718
2719
2720
2721
2722
2723
2724
2725    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
2726
2727    !*** TEST 006 ***
2728    !TEST   NUA LOGIC   WITH PATTERN "100 100 111 100"
2729    4474:
2730    TEST006:
2731            PO,     LOAD-ENUA(4377),                        !LOAD ENUA WITH ADDR[NEXT UWORD]
2732                    LOAD-ERROR(TEST006),                    !ERROR DIRECTORY KEY
2733                    DCS-CTR(C1.),                           !COMPARE AT NEXT UWORD
2734                    BUMP-VERIFY,                            !COUNT
2735            NEXT,   J/TEST007                               !
    (4474)  DCS[1.00.1.0.0.1]  BM[1110..00.10..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.1111]
2736
2737
2738
2739
2740
2741
2742
2743
2744    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```
2745
2746    !*** TEST 007 ***
2747    !TEST   NUA LOGIC   WITH PATTERN "100 011 111 111"
2748    4377:
2749    TEST007:
2750            PO,     LOAD-ENUA(7303),                        !LOAD ENUA WITH ADDR[NEXT UWORD]
2751                    LOAD-ERROR(TEST007),                    !ERROR DIRECTORY KEY
2752                    DCS-CTR(C1.),                           !COMPARE AT NEXT UWORD
2753            NEXT,   PAGE(3), BUTA(SUBR-A),                  !CHANGING TO PAGE 3 (ACTUALLY 7), VIA SUBR-A
2754                    J/NEXT007                               !NOTE OVERLAP:  NEXTPAGE<2:0>=ENUA<2:0>
    (4377)  DCS[1.00.1.0.0.0]  BM[1110..00.11..10.11..000..011...0.0.0..0..0...0.0000...0..0000.0...11.101...011.000.011]
2755                                                            !NOTE ALSO DCS MODULE FORCES NUA<11>=1, SO
2756                                                            !PAGES 3/7 ARE EQUIVALENT REFERENCES.
2757
2758
2759
2760
2761
2762    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
2763
2764    !*** TEST 007-1/2 ***
2765    !TEST    NUA LOGIC   WITH PATTERN "011 011 000 011"
2766    7303:
2767    NEXT007:
2768            NEXT,   PAGE(4), BUTA(SUBR-B),                  !CHANGING TO PAGE 4, VIA SUBR B
2769                    J/TEST010                               !OFF TO NEXT TEST
    (7303)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.100...111.111.101]
2770
2771
2772
2773    !.PAGE==========================================================================================================
2774
2775    .TOC   *   TEST010-011:  MICROSUBROUTINE OPERATION
2776
2777    !*************************************************************************************************
2778    !*                                                                                               *
2779    !*      TESTS:  010 - 011                                   UWORDS: 007 + 002                    *
2780    !*                                                                                               *
2781    !*      FUNCTIONS:      THESE TWO TESTS DETERMINE THAT THE RETURN REGISTER AND                   *
2782    !*                      ASSOCIATED DECODE, MUX, AND ENABLING LOGIC IS ABLE TO                    *
2783    !*                      LOAD THE 12-BIT NUA RETURN REGISTER FROM THE EMIT                        *
2784    !*                      FIELD, AND THEN ENTER THE REGISTER CONTENTS ONTO THE                     *
2785    !*                      UWORD ADDRESS BUS [WHEN ENABLED BY A BUTA[RETURN]] IN                    *
2786    !*                      TIME TO FETCH THE NEXT MICROWORD.  TWO ALTERNATING                       *
2787    !*                      BIT TESTS ARE USED TO CHECK THAT EACH BIT CAN BE SET                     *
2788    !*                      AND CLEARED, INDEPENDENT OF ADJACENT BITS.                               *
2789    !*                                                                                               *
2790    !*************************************************************************************************
2791
2792
2793
2794
```

```
2795
2796
2797    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
2798
2799    !*** TEST 010 ***
2800    !TEST RETURN LOGIC WITH PATTERN "1010 1010 0101" (5245)
2801    4775:
2802    TEST010:
2803            PO,     LOAD-ENUA(NEXT010),                     !LOAD ENUA WITH EXPECTED RETURN ADDRESS
2804                    LOAD-ERROR(TEST010),                    !ERROR DIRECTORY KEY
2805                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
2806            NEXT,   J/LOAD010                               !GO LOAD
    (4775)  DCS[1.00.1.0.0.0]  BM[1011..00.10..10.10..100..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.000]
2807
2808    4100:  !(FREE)
2809    LOAD010:
2810            SETUP,  RETURN/NEXT010,                         !SET RETURN ADDRESS FROM EMIT
2811            NEXT,   PAGE(7),                                !"SUBR" IS ON PAGE 7
2812                    BUTA(SUBR-B),                           !WITH B VERSION
2813                    J/SUBR010                               !"SUBR" DISP. ON PAGE
    (4100)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.000]
2814
2815    7000:  !(FREE)
2816    SUBR010:
2817            SETUP,  RETURN/ERROR010,                        !NOISE BITS IN EMIT-RETURN FIELD
2818            P3,     BUTA(CLR-FLAG-RES-UCON),                !NOISE IN UBF FIELD
2819            NEXT,   J/ZTARGET777                            !BEFORE DO BUTA[RETURN]
    (7000)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.00..011..000...0.0.0..0..0...0.0000...0..0000.0...11.010...111.111.111]
2820
2821    !   REMAINDER OF SUBROUTINE IS AT ZTARGET777 [LOCATION 7777[8]], WHICH IMMEDIATELY DOES A BUTA[RETURN]
2822    !   TO THE ADDRESS IN THE RETURN REGISTER, WHICH SHOULD BE THE VALUE LOADED IN WORD
2823    !   LOAD010.  THE RETURN REGISTER WAS SET TO POINT TO THE START OF THE NEXT TEST
2824    !   [NEXT010], AT WHICH POINT THE ENUA:TNUA COMPARE IS SET TO TAKE PLACE.
2825
2826    6543:
2827    ERROR010:
2828            PO,     BUMP-VERIFY,                            !COUNT
2829            NEXT,   PAGE(4),                                !IF WE END UP HERE, THE NOISE BITS
2830                    J/TEST010                               !WERE LOADED INTO THE RETURN REGISTER INSTEAD
    (6543)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.000...111.111.101]
2831
2832    5245:
2833    NEXT010:
2834            PO,     BUMP-VERIFY,                            !COUNT
2835            NEXT,   J/TEST011                               !RETURNED OK, COMPARE ENUA:TNUA DONE HERE
    (5245)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.111.111]
2836
2837
2838
2839
2840
2841
```

```
2842    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
2843
2844    !*** TEST 011 ***
2845    !TEST RETURN LOGIC WITH PATTERN "1101 0101 1010" (6532)
2846    5777:
2847    TEST011:
2848            PO,     LOAD-ENUA(INITIALIZE01),                !LOAD ENUA WITH EXPECTED RETURN ADDRESS
2849                    LOAD-ERROR(TEST011),                    !ERROR DIRECTORY KEY
2850                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
2851            NEXT,   J/LOAD011                               !GO LOAD
    (5777)  DCS[1.00.1.0.0.0]  BM[1100..00.11..01.01..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.001]
2852
2853    5001:  !(FREE)
2854    LOAD011:
2855            SETUP,  RETURN/INITIALIZE01,                    !SET RETURN ADDRESS IN EMIT
2856            NEXT,   PAGE(7),                                !"SUBR" IS ON PAGE 7
2857                    BUTA(SUBR-B),                           !VIA B VERSION
2858                    J/RESETUCONP                            !"SUBR" DISP. ON PAGE
    (5001)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.001]
2859
2860    !   "ONE-WORD SUBROUTINE" IS AT LABEL "RESETUCONP", WHICH IMMEDIATELY DOES A BUTA(RETURN)
2861    !   TO THE ADDRESS IN THE RETURN REGISTER, WHICH SHOULD BE THE VALUE LOADED AT SYMBOLIC LABEL
2862    !   "LOAD011".  THE RETURN REGISTER WAS SET TO POINT TO THE INITIALIZATION CODE ON THE NEXT PAGE:
2863    !   "INITIALIZE01", AT WHICH POINT THE ENUA:TNUA COMPARE IS SET TO TAKE PLACE.
2864    !   THIS SUBROUTINE ALSO 'ATTEMPTS' TO SET THE UCON CONTROL TO:  'PROC', 'BUSDIN+EMIT', AND
2865    !   'EN-CLK-IR', FOR USE IN THE FOLLOWING INITIALIZATION ROUTINE.
2866
2867
2868
2869    !  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +  +
2870
2871    !       ***  BUTA(RETURN) ERROR LOOP WORDS:
2872    !
2873    !       IF AT ANY TIME, A 'BUTA(RETURN)' FAILS, ONE OF THE FOLLOWING MICROWORDS WILL BE
2874    !       CONTINUOUSLY LOOPED UPON.  THIS IS DUE TO THE FACT THAT FOR EACH MICROWORD THAT
2875    !       CONTAINS THIS 'BUTA(RETURN)', THE UPF FIELD (WHICH WOULD NORMALLY NOT BE USED IN THIS
2876    !       MICROWORD EXECUTION), CONTAINS THE VALUE "J/BUTERROR#", WHERE NUMBER (#) IS THE
2877    !       CURRENT MICROWORD'S PAGE NUMBER (4-7).
2878
2879    4376:
2880    BUTERROR4:
2881            PO,     DCS-CTR(C0.),                           !FORCE AN ERROR, ERROR-CODE=LAST LOADED
2882            NEXT,   J/BUTERROR4                             !HANG UP
    (4376)  DCS[0.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.110]
2883
2884
2885    5376:
2886    BUTERROR5:
2887            PO,     DCS-CTR(C0.),                           !FORCE AN ERROR, ERROR-CODE=LAST LOADED
2888            NEXT,   J/BUTERROR5                             !HANG UP
    (5376)  DCS[0.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.110]
2889
2890
```

```
2891    6376:
2892    BUTERROR6:
2893            PO,     DCS-CTR(CO.),                           !FORCE AN ERROR, ERROR-CODE=LAST LOADED
2894            NEXT,   J/BUTERROR6                             !HANG UP
     (6376)  DCS[0.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.110]
2895
2896
2897    7376:
2898    BUTERROR7:
2899            PO,     !DCS-CTR(CO.),                          !FORCE AN ERROR, ERROR-CODE=LAST LOADED
2900            NEXT,   J/BUTERROR7                             !HANG UP
     (7376)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.110]
2901
2902
2903
2904    !.PAGE==========================================================================================================
2905
2906    .TOC    *   INIT REGISTERS, CONSOLE DEFAULT ERROR DISPLAY, REVISION CODE
2907
2908
2909    !***************************************************************************************
2910    !*
2911    !*      TESTS:  INITIALIZATION                          UWORDS:  011 + 011
2912    !*
2913    !*      FUNCTIONS:
2914    !*
2915    !*      TRY TO PUT AN OCTAL (000000) IN THE CONSOLE DISPLAY AS AN ERROR INDICATOR
2916    !*
2917    !*      PUT REVISION CODE, BIT15 CLEAR, IN GPR R5
2918    !*
2919    !*      SET FLAGS, FPS, PS, UBREAK REGISTERS TO ALL ZEROS TO DISABLE AS MUCH
2920    !*      AS POSSIBLE ANY SPURIOUS HOT FLOATING POINT STARTUPS, UBREAKS, ETC.
2921    !*
2922    !*      TURN OFF CACHE (SET BOTH FOFCE MISS BITS), AND TURN OFF KT (MEMORY
2923    !*      MANAGEMENT (BY CLEARING ENABLE BIT).
2924    !*
2925    !***************************************************************************************
2926
2927
2928                    !RETURNED OK, COMPARE OF ENUA:TNUA
2929                    !FOR PREV TEST DONE HERE
2930    6532:
2931    INITIALIZE01:
2932            SETUP,  RETURN/INITIALIZE03,                    !GO TO SUBR THAT PUTS REVISION NUMBER,
2933            NEXT,   GOTO-PAGE(7),                           !  WITH B<15>=(0), INTO B.M. GPR "R5"
2934                    J/INSERTREVNO                           !
     (6532)  DCS[0.00.0.0.0.0]  BM[0111..00.00..00.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.001.110]
2935
2936    7001:   !(FREE)
2937    INITIALIZE03:
2938            P3,     CSPD[17]←EMIT, EMIT/000014,             !EMITCON TO DISABLE CACHE, KT
2939            NEXT,   J/INITIALIZE04                          !
     (7001)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..001..100...0.0.0..0..0...0.0000...1..0000.0...11.000...000.000.011]
```

```
2940
2941    7003:  !(FREE)
2942    INITIALIZE04:
2943            P2-T,   D←CSPD(D17), D[C]←0,                    !GET ABOVE CONSTANT INTO D
2944            P2,     RES←CSPD(D17),                          !BITS<14:11>=0/00/0 FOR SR-LOAD, GUARD-DIS
2945            NEXT,   J/INITIALIZE05                          !
    (7003)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0000...0..1000.1...11.000...000.000.100]
2946
2947    7004:  !(FREE)
2948    INITIALIZE05:
2949            P2-T,   CCR[07-02]←D[07-02]-[1],                !LOAD CCR, DISABLING CACHE
2950            NEXT,   J/INITIALIZE06                          !  BITS<3:2> SET FORCE MISS
    (7004)  DCS[0.00.0.0.0.0]  BM[0001..00.01..00.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...000.000.101]
2951
2952    7005:  !(FREE)
2953    INITIALIZE06:
2954            P2-T,   MMR0←D-[1],                             !LOAD MMR0, DISABLING KT11
2955            NEXT,   J/INITIALIZE07                          !  BIT<00> CLEAR DISABLES KT11
    (7005)  DCS[0.00.0.0.0.0]  BM[0001..00.11..01.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...000.000.110]
2956
2957    7006:  !(FREE)
2958    INITIALIZE07:
2959            P2-T,   D←ZERO,                                 !DEFAULT TO ALL ZEROS FOR ERROR
2960                    SR←ZERO,                                !ZERO SR FOR JAMUPP IS ERROR
2961            NEXT,   GOTO-PAGE(4),                           !XFER
2962                    J/INITIALIZE10                          !
    (7006)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..100...0.1.1..0..0...0.0000...0..0000.0...11.100...001.000.001]
2963
2964    4101:  !(FREE)
2965    INITIALIZE10:
2966            SELECT, UCON-PROC,                              !ENABLE CLOCKING THE FOLLOWING
2967            ENABLE, EN-CLK-PS[15-12], EN-CLK-PS[7-4],       !  PROCESSOR REGISTERS:
2968                    EN-CLK-PS[3-0], EN-CLK-FLAG[8-0],       !
2969                    EN-CLK-FPS[7-4], EN-CLK-UBREAK[11-00],  !
2970                    BUSDIN←EMIT[15-00],                     !FOR UBREAK CONSTANT
2971            P0,     SET-UCON-CONTROL,                       !WRITE CONTROLS
2972                    BUMP-VERIFY,                            !COUNT
2973            P3,     BUTA(CUA-TRACK),                        !RESET CUA TRACKING
2974            NEXT,   J/INITIALIZE11                          !
    (4101)  DCS[0.00.0.0.0.1]  BM[1000..01.00..00.01..110..011...0.0.0..0..0...1.1001...0..0000.0...11.001...001.000.010]
2975
2976    4102:  !(FREE)
2977    INITIALIZE11:
2978            P0,     DCS-CTR(C15.),                          !DISABLE DCS-CTR FOR NOW
2979            EMITC,  EMIT/000000,                            !FOR UBREAK REGISTER LOAD
2980            P2,     PS[3-0]←D[3-0],                         !
2981                    UBREAK←BUSDIN[11-00],                   !
2982            P3,     PS[15-12]←D[15:13], PS[7-4]←D[7-4],     !
2983                    FPS[7-4]←D[7-4], FLAG[8-0]←D[15-8],     !
2984            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "INITIALIZE12" (+1. WORDS)
2985                    J/INITIALIZE12                          !   ERROR:  "TEST001"  (BACK AT START)
    (4102)  DCS[0.00.1.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...000.000.001]
2986
```

```
2987    4001:
2988    INITIALIZE12:
2989            SETUP,  RETURN/TEST012A,                        !RETURN TO NEXT TEST START
2990            NEXT,   CALL[DISPLAY]                           !GO DISPLAY CONTENTS OF D-REGISTER IN LIGHTS
    (4001)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.010.001]
2991
2992
2993
2994    !.PAGE=============================================================================================================
2995
2996    .TOC    *   TEST012-050:  IR DECODE (INSTR1, INSTR5, FLTPT, RELATED "BUTS")
2997
2998    !*************************************************************************************
2999    !*
3000    !*      TESTS:  012 - 050                               UWORDS: 274 + 206
3001    !*
3002    !*      FUNCTIONS:
3003    !*
3004    !*      THE FOLLOWING TESTS EXERCISE THE IR-DECODE RELATED LOGIC:
3005    !*
3006    !*              INSTR-1, INSTR-5, FLOATING-POINT DECODE 'BUTS'
3007    !*              IR<15:12>, IR<11> (TWO), IR<9:6>, IR<5:3> BIT 'BUTS'
3008    !*              MOV/DR7, BYTE/DM0/SM0, DR6-7 DECODE-RELATED 'BUTS'
3009    !*
3010    !*      NOTE ALSO THAT THE FIRST TIME THE PROCESSOR 'UCON':
3011    !*              BUSDIN+EMIT, AND EN-CLK-IR, IS EMPLOYED IS IN TEST-012-A.
3012    !*
3013    !*************************************************************************************
3014
3015
3016
3017
3018
3019
3020
3021    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3022
3023    !*** TEST 012 ***
3024    !TEST-012 USES A DATA PATTERN OF:  "1 111 111 111 111 111" (177777)
3025
3026    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3027
3028    !* PART A *
3029    !TEST-012-A CHECKS THAT BUT[IR<15:12>] READS THE "1111" IN IR<15:12>H CORRECTLY
3030    5775:
3031    TEST012A:
3032            P0,     LOAD-ENUA(ZTARGET417),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3033                    LOAD-ERROR(TEST012A),                   !ERROR DIRECTORY KEY
3034                    DCS-CTR(C5.),                           !COMPARE ENUA:TNUA IN 5. MICROWORDS
3035            NEXT,   J/SETIRA                                !SETUP FOR IR TESTS
    (5775)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...111.110.000]
3036
```

```
3037    !*** SETUP PROCESSOR UCON FOR BUSDIN <- EMIT, CLOCKING INSTRUCTION REGISTER ***
3038    5760:
3039    SETIRA:
3040            SELECT, UCON-PROC,                              !SELECT PROCESSOR UCON CONTROL:
3041            ENABLE, EN-CLK-IR[15-00],                       !  ENABLE CLOCK IR OPERATION
3042                    BUSDIN←EMIT[15-00],                     !  PUT EMIT[15:00] ONTO BUSDIN
3043            P0,     SET-UCON-CONTROL,                       !LOAD UCON REGISTER AT P0
3044                    BUMP-VERIFY,                            !COUNT
3045            NEXT,   J/LOAD012A                              !GO TO FIRST TEST, PART A
     (5760)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...000.000.010]
3046
3047
3048    5002:  !(FREE)
3049    LOAD012A:
3050            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
3051                    EMIT/177777,                            !(177777)
3052            NEXT,   J/GOBUT012A                             !GO SETUP FOR "BUT"
     (5002)  DCS[0.00.0.0.0.0]  BM[1111..00.11..11.11..111..111...0.0.0..0..0...1.1010...0..0000.0...11.000...000.000.011]
3053
3054
3055    5003:  !(FREE)
3056    GOBUT012A:
3057            SETUP,  RETURN/TEST012B,                        !RETURN TO START OF NEXT SUBTEST
3058            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3059                    J/BUTIR15-12                            !GO DO "BUT" ON IR<15:12>H
     (5003)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.000]
3060
3061
3062    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3063
3064    !* PART B *
3065    !TEST-012-B CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "1" IN IR<11>H CORRECTLY,
3066    !AND THE FLTPT DECODE ROM GETS ADDRESS (776), WHICH IS A CMPF/D INSTR;
3067    !DATA OUTPUT SHOULD BE (17)
3068    5773:
3069    TEST012B:
3070            P0,     LOAD-EMUA(ZTARGET437),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3071                    LOAD-ERROR(TEST012B),                   !ERROR DIRECTORY KEY
3072                    DCS-CTR(C3.),                           !COMPARE EMUA:TMUA IN 3. MICROWORDS
3073            NEXT,   J/GOBUT012B                             !GO SETUP FOR "BUT"
     (5773)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.100]
3074
3075
3076    5004:  !(FREE)
3077    GOBUT012B:
3078            SETUP,  RETURN/TEST012C,                        !RETURN TO START OF NEXT SUBTEST
3079            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3080                    J/BUTIR11FLTPT3-0                       !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
     (5004)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]
3081
3082
3083    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```
3084
3085    !* PART C *
3086    !TEST-012-C CHECKS THAT BUTR[IR<11>B] READS THE "1" IN IR<11>H CORRECTLY
3087    5771:
3088    TEST012C:
3089            PO,     LOAD-ENUA(ZTARGET403),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3090                    LOAD-ERROR(TEST012C),                   !ERROR DIRECTORY KEY
3091                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3092                    BUMP-VERIFY,                            !COUNT
3093            NEXT,   J/GOBUT012C                             !GO SETUP FOR "BUT"
    (5771)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.101]
3094
3095
3096    5005:  !(FREE)
3097    GOBUT012C:
3098            SETUP,  RETURN/TEST012D,                        !RETURN TO START OF NEXT SUBTEST
3099            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3100                    J/BUTIR11B                              !GO DO "BUT" ON IR<11>H
    (5005)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.010]
3101
3102
3103    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3104
3105    !* PART D *
3106    !TEST-012-D CHECKS THAT BUT[IR<9:6>] READS THE "1111" IN IR<9:6>H CORRECTLY
3107    5767:
3108    TEST012D:
3109            PO,     LOAD-ENUA(ZTARGET417),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3110                    LOAD-ERROR(TEST012D),                   !ERROR DIRECTORY KEY
3111                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3112            NEXT,   J/GOBUT012D                             !GO SETUP FOR "BUT"
    (5767)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.110]
3113
3114
3115    5006:  !(FREE)
3116    GOBUT012D:
3117            SETUP,  RETURN/TEST012E,                        !RETURN TO START OF NEXT SUBTEST
3118            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3119                    J/BUTIR9-6                              !GO DO "BUT" ON IR<9:6>H
    (5006)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.100]
3120
3121
3122    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3123
3124    !* PART E *
3125    !TEST-012-E CHECKS THAT BUT[MOV-DR7*IR<5:3>] READS THE (-FLTPT*MOV+FLTPT*DR7) AND "111" IN IR<5:3>H CORRECTLY
3126    5765:
3127    TEST012E:
3128            PO,     LOAD-ENUA(ZTARGET417),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3129                    LOAD-ERROR(TEST012E),                   !ERROR DIRECTORY KEY
3130                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3131            NEXT,   J/GOBUT012E                             !GO SETUP FOR "BUT"
```

```
      (5765)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.111]
3132
3133
3134    5007:  !(FREE)
3135    GOBUT012E:
3136           SETUP,  RETURN/TEST012F,                          !RETURN TO START OF NEXT SUBTEST
3137           NEXT,   GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
3138                   J/BUTMOVDR7IR5-3                          !GO DO "BUT" ON (-FLTPT*MOV+FLTPT*DR7) # IR<5:3>H
      (5007)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.101]
3139
3140
3141    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3142
3143    !* PART F *
3144    !TEST-012-F CHECKS THAT BUT[DR6-7 L] READS THE "11" IN IR<2:1> H CORRECTLY
3145    !AND DOES ASSERT THE SIGNAL
3146    5764:
3147    TEST012F:
3148           PO,     LOAD-ENUA(ZTARGET4C2),                    !LOAD EXPECTED ADDRESS AFTER "BUT"
3149                   LOAD-ERROR(TEST012F),                     !ERROR DIRECTORY KEY
3150                   DCS-CTR(C3.),                             !COMPARE ENUA:TNUA IN 3. MICROWORDS
3151           NEXT,   J/GOBUT012F                               !GO SETUP FOR "BUT"
      (5764)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.000]
3152
3153
3154    5010:  !(FREE)
3155    GOBUT012F:
3156           SETUP,  RETURN/TEST012G,                          !RETURN TO START OF NEXT SUBTEST
3157           PO,     BUMP-VERIFY,                              !COUNT
3158           NEXT,   GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
3159                   J/BUTDR6-7L                               !GO DO "BUT" ON DR 6/7 L
      (5010)  DCS[0.00.0.0.0.1]  BM[0101..00.11..11.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.111]
3160
3161
3162    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3163
3164    !* PART G *
3165    !TEST-012G CHECKS THAT BUT[INSTR1] READS THE ONES IN IR<15:00>H CORRECTLY
3166    !AS CLASS-A-FLTPT, AND CORRECTLY TARGETS TO INSTR1 FLTPT (474)
3167    !  BIT<1:0> = FLAG<4:5>H = "00" FROM INITIALIZATION CODE
3168    5763:
3169    TEST012G:
3170           PO,     LOAD-ENUA(ZTARGET474),                    !LOAD EXPECTED ADDRESS AFTER "BUT"
3171                   LOAD-ERROR(TEST012G),                     !ERROR DIRECTORY KEY
3172                   DCS-CTR(C3.),                             !COMPARE ENUA:TNUA IN 3. MICROWORDS
3173           NEXT,   J/GOBUT012G                               !GO SETUP FOR "BUT"
      (5763)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..111..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.001]
3174
3175
3176    5011:  !(FREE)
3177    GOBUT012G:
3178           SETUP,  RETURN/SCOPE012,                          !RETURN TO SCOPE LOOP TEST WORD
```

```
3179            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3180                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
     (5011)  DCS[0.00.0.0.0.0]  BM[0101..00.00..00.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
3181
3182
3183
3184    5012:  !(FREE)
3185    SCOPE012:
3186            P0,     BUMP-VERIFY,                            !COUNT
3187            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST013A" [+1. WORDS]
3188                    J/TEST013A                              !    ERROR:  "SETIRA"   [-16. WORDS]
     (5012)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.110.001]
3189
3190
3191
3192
3193
3194
3195    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3196
3197    !*** TEST 013 ***
3198    !TEST-013 USES AN IR DATA PATTERN OF:  "0 000 000 000 000 000" (000000)
3199
3200    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3201
3202    !* PART A *
3203    !TEST-013-A CHECKS THAT BUT [IR<15:12>] READS THE "0000" IN IR<15:12>H CORRECTLY
3204    5761:
3205    TEST013A:
3206            P0,     LOAD-ENUA(ZTARGET400),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3207                    LOAD-ERROR(TEST013A),                   !ERROR DIRECTORY KEY
3208                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
3209            NEXT,   J/LOAD013A                              !GO LOAD PATTERN
     (5761)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.100.100]
3210
3211
3212    5744:
3213    LOAD013A:
3214            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
3215                    EMIT/000000,                            !(000000)
3216            NEXT,   J/GOBUT013A                             !GO SETUP FOR "BUT"
     (5744)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...000.001.011]
3217
3218
3219    5013:  !(FREE)
3220    GOBUT013A:
3221            SETUP,  RETURN/TEST013B,                        !RETURN TO START OF NEXT SUBTEST
3222            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3223                    J/BUTIR15-12                            !GO DO "BUT" ON IR<15:12>H
     (5013)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.000]
3224
3225
```

```
3226    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3227
3228    !* PART B *
3229    !TEST-013-B CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "0" IN IR<11>H CORRECTLY,
3230    !AND THE FLTPT DECODE ROM GETS ADDRESS (000), WHICH IS A SETF/SETI/CFCC INSTR;
3231    !DATA OUTPUT SHOULD BE (00)
3232    5757:
3233    TEST013B:
3234            PO,     LOAD-ENUA(ZTARGET400),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3235                    LOAD-ERROR(TEST013B),                   !ERROR DIRECTORY KEY
3236                    DCS-CTR(C3.),                           !COMPARE ENUA-TNUA IN 3. MICROWORDS
3237                    BUMP-VERIFY,                            !COUNT
3238            NEXT,   J/GOBUT013B                             !GO SETUP FOR "BUT"
    (5757)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.100]
3239
3240
3241    5014:  !(FREE)
3242    GOBUT013B:
3243            SETUP,  RETURN/TEST013C,                        !RETURN TO START OF NEXT SUBTEST
3244            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3245                    J/BUTIR11FLTPT3-0                       !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
    (5014)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]
3246
3247
3248    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3249
3250    !* PART C *
3251    !TEST-013-C CHECKS THAT BUTR[IR<11>B] READS THE "0" IN IR<11>H CORRECTLY
3252    5755:
3253    TEST013C:
3254            PO,     LOAD-ENUA(ZTARGET401),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3255                    LOAD-ERROR(TEST013C),                   !ERROR DIRECTORY KEY
3256                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3257            NEXT,   J/GOBUT013C                             !GO SETUP FOR "BUT"
    (5755)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.101]
3258
3259
3260    5015:  !(FREE)
3261    GOBUT013C:
3262            SETUP,  RETURN/TEST013D,                        !RETURN TO START OF NEXT SUBTEST
3263            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3264                    J/BUTIR11B                              !GO DO BUT ON IR<11>H
    (5015)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.010]
3265
3266
3267    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3268
3269    !* PART D *
3270    !TEST-013-D CHECKS THAT BUT[IR<9:6>] READS THE "0000" IN IR<9:6>H CORRECTLY
3271    5753:
3272    TEST013D:
3273            PO,     LOAD-ENUA(ZTARGET400),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
```

```
3274                    LOAD-ERROR(TEST013D),                   !ERROR DIRECTORY KEY
3275                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3276            NEXT,   J/GOBUT013D                             !GO SETUP FOR "BUT"
    (5753)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.110]
3277
3278
3279    5016:   !(FREE)
3280    GOBUT013D:
3281            SETUP,  RETURN/TEST013E,                        !RETURN TO START OF NEXT SUBTEST
3282            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3283                    J/BUTIR9-6                              !GO DO "BUT" ON IR<9:6>H
    (5016)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.100]
3284
3285
3286    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
3287
3288    !* PART E *
3289    !TEST-013-E CHECKS THAT BUT[MOV-DR7*IR<5:3>] READS THE -(-FLTPT*MOV+FLTPT*DR7) AND "000" IN IR<5:3>H CORRECTLY
3290    5751:
3291    TEST013E:
3292            PO,     LOAD-ENUA(ZTARGET400),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3293                    LOAD-ERROR(TEST013E),                   !ERROR DIRECTORY KEY
3294                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3295            NEXT,   J/GOBUT013E                             !GO SETUP FOR "BUT"
    (5751)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.111]
3296
3297
3298    5017:   !(FREE)
3299    GOBUT013E:
3300            SETUP,  RETURN/TEST013F,                        !RETURN TO START OF NEXT SUBTEST
3301            PO,     BUMP-VERIFY,                            !COUNT
3302            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3303                    J/BUTMOVDR7IR5-3                        !GO DO "BUT" ON (-FLTPT*MOV+FLTPT*DR7) # IR<5:3>H
    (5017)  DCS[0.00.0.0.0.1]  BM[0101..00.11..11.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.101]
3304
3305
3306    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
3307
3308    !* PART F *
3309    !TEST-013-F CHECKS THAT BUT[INSTR5] READS THE ZEROS IN IR<15:00>H CORRECTLY
3310    !AS (000000)=HALT, AND CORRECTLY TARGETS TO (434)
3311    5750:
3312    TEST013F:
3313            PO,     LOAD-ENUA(ZTARGET434),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3314                    LOAD-ERROR(TEST013F),                   !ERROR DIRECTORY KEY
3315                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3316            NEXT,   J/GOBUT013F                             !GO SETUP FOR "BUT"
    (5750)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.000]
3317
3318
3319    5020:   !(FREE)
3320    GOBUT013F:
```

```
3321            SETUP,  RETURN/TEST013G,                        !RETURN TO START OF NEXT SUBTEST
3322            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3323                    J/BUTINSTR5                             !GO DO INSTR5 "BUT"
    (5020)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
3324
3325    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3326
3327    !* PART G *
3328    !TEST-013-G CHECKS THAT BUT[INSTR1] READS THE ZEROS IN IR<15:00>H CORRECTLY
3329    !AS NOT[CLASS-A THRU G], AND CORRECTLY TARGETS TO (417) [OTHER]
3330    5747:
3331    TEST013G:
3332            PO,     LOAD-ENUA(ZTARGET417),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3333                    LOAD-ERROR(TEST013G),                   !ERROR DIRECTORY KEY
3334                    DCS-CTR(C3,),                           !COMPARE ENUA:INUA IN 3. MICROWORDS
3335            NEXT,   J/GOBUT013G                             !GO SETUP FOR "BUT"
    (5747)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.001]
3336
3337
3338    5021:  !(FREE)
3339    GOBUT013G:
3340            SETUP,  RETURN/SCOPE013,                        !RETURN TO SCOPE LOOP TEST WORD
3341            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3342                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5021)  DCS[0.00.0.0.0.0]  BM[0101..00.00..00.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
3343
3344
3345
3346    5022:  !(FREE)
3347    SCOPE013:
3348            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST014A" [+1. WORD]
3349                    J/TEST014A                              !   ERROR:  "LOAD013A" [-14. WORDS]
    (5022)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.100.101]
3350
3351
3352
3353
3354
3355
3356    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3357
3358    !*** TEST 014 ***
3359    !TEST-014 USES AN IR DATA PATTERN OF:  "0 000 000 001 010 101" (000125)
3360
3361    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3362
3363    !* PART A *
3364    !TEST-014-A CHECKS THAT BUT[INSTR5] READS THE IR CORRECTLY
3365    !AS ROM ADDRESS=(125) ON THE INSTR5 E88 ROM, AND RECEIVES THE DIAGNOSTIC VALUE
3366    !OF (12), TARGETING TO (432) AFTER THE DECODE
3367    5745:
3368    TEST014A:
```

```
3369            P0,     LOAD-ENUA(ZTARGET432),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3370                    LOAD-ERROR(TEST014A),                   !ERROR DIRECTORY KEY
3371                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
3372            NEXT,   J/LOAD014A                              !GO LOAD PATTERN
    (5745)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...111.100.010]
3373
3374
3375    5742:
3376    LOAD014A:
3377            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
3378                    EMIT/000125,                            !(000125)
3379            NEXT,   J/GOBUT014A                             !GO SETUP FOR "BUT"
    (5742)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..010..101...0.0.0..0..0...1.1010...0..0000.0...11.000...000.010.011]
3380
3381    5023:  !(FREE)
3382    GOBUT014A:
3383            SETUP,  RETURN/TEST014B,                        !RETURN TO START OF NEXT SUBTEST
3384            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3385                    J/BUTINSTR5                             !GO DO INSTR5 "BUT"
    (5023)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
3386
3387
3388    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
3389
3390    !* PART B *
3391    !TEST-014-B CHECKS THAT BUT[DR6-7 L] READS THE "10" IN IR<2:1> H CORRECTLY
3392    !AND DOES NOT ASSERT THE SIGNAL
3393    5752:
3394    TEST014B:
3395            P0,     LOAD-ENUA(ZTARGET403),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3396                    LOAD-ERROR(TEST014B),                   !ERROR DIRECTORY KEY
3397                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3398                    BUMP-VERIFY,                            !COUNT
3399            NEXT,   J/GOBUT014B                             !GO SETUP FOR "BUT"
    (5752)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.100]
3400
3401
3402    5024:  !(FREE)
3403    GOBUT014B:
3404            SETUP,  RETURN/TEST014C,                        !RETURN TO START OF NEXT SUBTEST
3405            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3406                    J/BUTDR6-7L                             !GO DO DR 6-7 L "BUT"
    (5024)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.111]
3407
3408    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
3409
3410    !* PART C *
3411    !TEST-014-C CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
3412    !AS CLASS-E=JMP, IR<5:3>H="010", AND TARGETS TO (652)
3413    5762:
3414    TEST014C:
3415            P0,     LOAD-ENUA(ZTARGET652),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
```

```
3416                    LOAD-ERROR(TEST014C),                   !ERROR DIRECTORY KEY
3417                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3418            NEXT,   J/GOBUT014C                             !GO SETUP FOR "BUT"
    (5762)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.10..101..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.101]
3419
3420
3421    5025:   !(FREE)
3422    GOBUT014C:
3423            SETUP,  RETURN/TEST014D,                        !RETURN TO START OF NEXT SUBTEST
3424            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3425                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5025)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
3426
3427
3428
3429    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3430
3431    !* PART D *
3432    !TEST-014-D CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "D" IN IR<11>H CORRECTLY,
3433    !AND THE FLTPT DECODE ROM GETS ADDRESS (020), WHICH IS A STST INSTR;
3434    !DATA OUTPUT SHOULD BE (01)
3435    5710:
3436    TEST014D:
3437            P0,     LOAD-ENUA(ZTARGET401),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3438                    LOAD-ERROR(TEST014D),                   !ERROR DIRECTORY KEY
3439                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3440            NEXT,   J/GOBUT014D                             !GO SETUP FOR "BUT"
    (5710)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.110]
3441
3442
3443    5026:   !(FREE)
3444    GOBUT014D:
3445            SETUP,  RETURN/SCOPE014,                        !RETURN TO SCOPE LOOP TEST WORD
3446            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3447                    J/BUTIR11FLTPT3-0                       !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
    (5026)  DCS[0.00.0.0.0.0]  BM[0101..00.00..00.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]
3448
3449
3450
3451    5027:   !(FREE)
3452    SCOPE014:
3453            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST015A" [+1. WORD]
3454                    J/TEST015A                              !   ERROR:  "LOAD014A" [-8. WORDS]
    (5027)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.100.011]
3455
3456
3457
3458
3459
3460
3461    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3462
```

```
3463    !*** TEST 015 ***
3464    !TEST-015 USES AN IR DATA PATTERN OF:  "0 000 000 001 101 010" (000152)
3465
3466    !  -  -  -
```

```
     (5031)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.111]
3512
3513    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3514
3515    !* PART C *
3516    !TEST-015-C CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
3517    !AS CLASS-E=JMP, IR<5:3>H="101", AND TARGETS TO (655)
3518    5722:
3519    TEST015C:
3520            PO,     LOAD-ENUA(ZTARGET655),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3521                    LOAD-ERROR(TEST015C),                   !ERROR DIRECTORY KEY
3522                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3523            NEXT,   J/GOBUT015C                             !GO SETUP FOR "BUT"
     (5722)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.10..101..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.010]
3524
3525
3526    5032:  !(FREE)
3527    GOBUT015C:
3528            SETUP,  RETURN/SCOPE015,                        !RETURN TO SCOPE LOOP TEST WORD
3529            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3530                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
     (5032)  DCS[0.00.0.0.0.0]  BM[0101..00.00..00.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
3531
3532    5033:  !(FREE)
3533    SCOPE015:
3534            PO,     BUMP-VERIFY,                            !COUNT
3535            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST016A" [+1. WORD]
3536                    J/TEST016A                              !   ERROR:  "LOAD015A" [-6. WORDS]
     (5033)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.100.001]
3537
3538
3539
3540
3541
3542
3543    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3544
3545    !*** TEST 016 ***
3546    !TEST-016 USES AN IR DATA PATTERN OF:  "1 000 000 000 000 000" (100000)
3547
3548    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3549
3550    !* PART A *
3551    !TEST-016-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
3552    !AS CLASS-F=BRANCH, IR<14:11>H="0000", IR<15#10:08>H#"0000",
3553    !AND TARGETS TO (757)
3554    5741:
3555    TEST016A:
3556            PO,     LOAD-ENUA(ZTARGET757),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3557                    LOAD-ERROR(TEST016A),                   !ERROR DIRECTORY KEY
3558                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
3559            NEXT,   J/LOAD016A                              !GO LOAD PATTERN
```

```
     (5741)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.000...111.011.110]
3560
3561
3562     5736:
3563     LOAD016A:
3564             P2-U,   IR←EMIT,                                    !LOAD IR WITH TEST PATTERN
3565                     EMIT/100000,                                !(100000)
3566             NEXT,   J/GOBUT016A                                 !GO SETUP FOR "BUT"
     (5736)  DCS[0.00.0.0.0.0]  BM[1000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...000.011.100]
3567
3568
3569     5034:  !(FREE)
3570     GOBUT016A:
3571             SETUP,  RETURN/SCOPE016,                            !RETURN TO SCOPE LOOP TEST WORD
3572             P0,     BUMP-VERIFY,                                !COUNT
3573             NEXT,   GOTO-PAGE(7),                               !BUT TABLE IS ON PAGE 7
3574                     J/BUTINSTR1                                 !GO DO INSTR1 "BUT"
     (5034)  DCS[0.00.0.0.0.1]  BM[0101..00.00..00.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
3575
3576
3577     5035:  !(FREE)
3578     SCOPE016:
3579             NEXT,   BUTD[SCOPE],                                !NO ERROR:  "TEST017A" [+1. WORD]
3580                     J/TEST017A                                  !   ERROR:  "LOAD016A" [-2. WORDS]
     (5035)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.011.111]
3581
3582
3583
3584
3585
3586
3587     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3588
3589     !*** TEST 017 ***
3590     !TEST-017 USES A DATA PATTERN OF:  "0 000 000 101 010 010" (000522)
3591
3592     !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3593
3594     !* PART A *
3595     !TEST-017-A CHECKS THAT BUT[IR<9:6>] READS THE ALTERNATING PATTERN "0101"
3596     !IN IR<9:6>H CORRECTLY
3597     5737:
3598     TEST017A:
3599             P0,     LOAD-ENUA(ZTARGET405),                      !LOAD EXPECTED ADDRESS AFTER "BUT"
3600                     LOAD-ERROR(TEST017A),                       !ERROR DIRECTORY KEY
3601                     DCS-CTR(C4.),                               !COMPARE ENUA:TNUA IN 4. MICROWORDS
3602             NEXT,   J/LOAD017A                                  !GO LOAD PATTERN
     (5737)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...111.011.010]
3603
3604
3605     5732:
3606     LOAD017A:
3607             P2-U,   IR←EMIT,                                    !LOAD IR WITH TEST PATTERN
```

```
3608                    EMIT/000522,                                    !(000522)
3609            NEXT,   J/GOBUT017A                                     !GO SETUP FOR "BUT"
    (5732)  DCS[0.00.0.0.0.0]  BM[0000..00.00..01.01..010..010...0.0.0..0..0...1.1010...0..0000.0...11.000...000.011.110]
3610
3611
3612    5036:  !(FREE)
3613    GOBUT017A:
3614            SETUP,  RETURN/TEST017B,                                !RETURN TO START OF NEXT SUBTEST
3615            NEXT,   GOTO-PAGE(7),                                   !BUT TABLE IS ON PAGE 7
3616                    J/BUTIR3-6                                      !GO DO "BUT" ON IR<9:6>H
    (5036)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.100]
3617
3618
3619    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
3620
3621    !* PART B *
3622    !TEST-017-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
3623    !AS CLASS-F=BRANCH, IR<14:11>H="0000", IR<15#10:08>H#"0000",
3624    !AND TARGETS TO (757)
3625    5735:
3626    TEST017B:
3627            PO,     LOAD-ENUA(ZTARGET757),                          !LOAD EXPECTED ADDRESS AFTER "BUT"
3628                    LOAD-ERROR(TEST017B),                           !ERROR DIRECTORY KEY
3629                    DCS-CTR(C3.),                                   !COMPARE ENUA:TNUA IN 3. MICROWORDS
3630                    BUMP-VERIFY,                                    !COUNT
3631            NEXT,   J/GOBUT017B                                     !GO SETUP FOR "BUT"
    (5735)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.111]
3632
3633
3634    5037:  !(FREE)
3635    GOBUT017B:
3636            SETUP,  RETURN/SCOPE017,                                !RETURN TO SCOPE LOOP TEST WORD
3637            NEXT,   GOTO-PAGE(7),                                   !BUT TABLE IS ON PAGE 7
3638                    J/BUTINSTR1                                     !GO DO INSTR1 "BUT"
    (5037)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
3639
3640
3641    5040:  !(FREE)
3642    SCOPE017:
3643            NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "TEST020A" [+1. WORD]
3644                    J/TEST020A                                      !   ERROR:  "LOAD017A" [-4. WORDS]
    (5040)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.011.011]
3645
3646
3647
3648
3649
3650
3651    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
3652
3653    !*** TEST 020 ***
3654    !TEST-020 USES A DATA PATTERN OF:  "0 000 001 010 101 111" (001257)
```

```
3655
3656    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3657
3658    !* PART A *
3659    !TEST-020-A CHECKS THAT BUT[IR<9:6>] READS THE ALTERNATING PATTERN "1010"
3660    !IN IR<9:6>H CORRECTLY
3661    5733:
3662    TEST020A:
3663            PO,     LOAD-ENUA(ZTARGET412),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3664                    LOAD-ERROR(TEST020A),                   !ERROR DIRECTORY KEY
3665                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
3666            NEXT,   J/LOAD020A                              !GO LOAD PATTERN
     (5733)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...111.010.100]
3667
3668
3669    5724:
3670    LOAD020A:
3671            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
3672                    EMIT/001257,                            !(001257)
3673            NEXT,   J/GOBUT020A                             !GO SETUP FOR "BUT"
     (5724)  DCS[0.00.0.0.0.0]  BM[0000..00.00..10.10..101..111...0.0.0..0..0...1.1010...0..0000.0...11.000...000.100.001]
3674
3675
3676    5041:  !(FREE)
3677    GOBUT020A:
3678            SETUP,  RETURN/TEST020B,                        !RETURN TO START OF NEXT SUBTEST
3679            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3680                    J/BUTIR9-6                              !GO DO "BUT" ON IR<9:6>H
     (5041)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.100]
3681
3682
3683    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3684
3685    !* PART B *
3686    !TEST-020-B CHECKS THAT BUT[MOV-DR7*IR<5:3>] READS THE -(-FLTPT*MOV+FLTPT*DR7) AND
3687    !ALTERNATING PATTERN "101" IN IR<5:3>H CORRECTLY
3688    5731:
3689    TEST020B:
3690            PO,     LOAD-ENUA(ZTARGET405),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3691                    LOAD-ERROR(TEST020B),                   !ERROR DIRECTORY KEY
3692                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3693            NEXT,   J/GOBUT020B                             !GO SETUP FOR "BUT"
     (5731)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.010]
3694
3695
3696    5042:  !(FREE)
3697    GOBUT020B:
3698            SETUP,  RETURN/TEST020C,                        !RETURN TO START OF NEXT SUBTEST
3699            PO,     BUMP-VERIFY,                            !COUNT
3700            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3701                    J/BUTMOVDR7IR5-3                        !GO DO "BUT"
     (5042)  DCS[0.00.0.0.0.1]  BM[0101..00.11..10.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.101]
```

```
3702
3703
3704    ! - - -
```

```
3751
3752
3753    5720:
3754    LOAD021A:
3755            P0,     BUMP-VERIFY,                            !COUNT
3756            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
3757                    EMIT/002315,                            !(002315)
3758            NEXT,   J/GOBUT021A                             !GO SETUP FOR "BUT"
    (5720)  DCS[0.00.0.0.0.1]  BM[0000..00.01..00.11..001..101...0.0.0..0..0...1.1010...0..0000.0...11.000...000.100.101]
3759
3760
3761    5045:  !(FREE)
3762    GOBUT021A:
3763            SETUP,  RETURN/TEST021B,                        !RETURN TO START OF NEXT SUBTEST
3764            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3765                    J/BUTDMSMBYTE                           !GO DO "BUT" ON DMD#SMD#BYTE
    (5045)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.011]
3766
3767
3768    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3769
3770    !* PART B *
3771    !TEST-021-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
3772    !AS CLASS-F=BRANCH, IR<14:11>H="0000", IR<15#10:08>H#"0000",
3773    !AND TARGETS TO (757)
3774    5723:
3775    TEST021B:
3776            P0,     LOAD-ENUA(ZTARGET757),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3777                    LOAD-ERROR(TEST021B),                   !ERROR DIRECTORY KEY
3778                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3779            NEXT,   J/GOBUT021B                             !GO SETUP FOR "BUT"
    (5723)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.110]
3780
3781
3782    5046:  !(FREE)
3783    GOBUT021B:
3784            SETUP,  RETURN/TEST021C,                        !RETURN TO START OF NEXT SUBTEST
3785            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3786                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5046)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
3787
3788
3789
3790    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3791
3792    !* PART C *
3793    !TEST-021-C CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "0" IN IR<11>H CORRECTLY,
3794    !AND THE FLTPT DECODE ROM GETS ADDRESS (462), WHICH IS A ADDF/D MODE1-7 INSTR;
3795    !DATA OUTPUT SHOULD BE (11)
3796    5774:
3797    TEST021C:
3798            P0,     LOAD-ENUA(ZTARGET411),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
```

```
3799                    LOAD-ERROR(TEST021C),                   !ERROR DIRECTORY KEY
3800                    DCS-CTR(C3.),                           !COMPARE ENUA:INUA IN 3. MICROWORDS
3801            NEXT,   J/GOBUT021C                             !GO SETUP FOR "BUT"
    (5774)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.111]
3802
3803
3804    5047:  !(FREE)
3805    GOBUT021C:
3806            SETUP,  RETURN/SCOPE021,                        !RETURN TO SCOPE LOOP TEST WORD
3807            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3808                    J/BUTIR11FLTPT3-0                       !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
    (5047)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]
3809
3810
3811    5050:  !(FREE)
3812    SCOPE021:
3813            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST022A" [+1. WORDS]
3814                    J/TEST022A                              !   ERROR:  "LOAD021A" [-6. WORDS]
    (5050)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.010.001]
3815
3816
3817
3818
3819
3820
3821    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3822
3823    !*** TEST 022 ***
3824    !TEST-022 USES A DATA PATTERN OF:  "0 000 011 000 110 011" (003063)
3825
3826    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3827
3828    !* PART A *
3829    !TEST-022-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
3830    !AS CLASS-F=BRANCH, IR<14:11>H="0000", IR<15#10:08>H#"0000",
3831    !AND TARGETS TO (757)
3832    5721:
3833    TEST022A:
3834            PO,     LOAD-ENUA(ZTARGET757),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3835                    LOAD-ERROR(TEST022A),                   !ERROR DIRECTORY KEY
3836                    DCS-CTR(C4.),                           !COMPARE ENUA:INUA IN 4. MICROWORDS
3837            NEXT,   J/LOAD022A                              !GO LOAD PATTERN
    (5721)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.000...111.001.110]
3838
3839
3840    5716:
3841    LOAD022A:
3842            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
3843                    EMIT/003063,                            !(003063)
3844            NEXT,   J/GOBUT022A                             !GO SETUP FOR "BUT"
    (5716)  DCS[0.00.0.0.0.0]  BM[0000..00.01..10.00..110..011...0.0.0..0..0...1.1010...0..0000.0...11.000...000.101.001]
3845
3846
```

```
3847    5051:  !(FREE)
3848    GOBUT022A:
3849            SETUP,  RETURN/SCOPE022,                        !RETURN TO SCOPE LOOP TEST WORD
3850            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3851                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5051)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
3852
3853
3854
3855    5052:  !(FREE)
3856    SCOPE022:
3857            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST023A" [+1. WORD]
3858                    J/TEST023A                              !   ERROR:  "LOAD022A" [-2. WORDS]
    (5052)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.001.111]
3859
3860
3861
3862
3863
3864
3865    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3866
3867    !*** TEST 023 ***
3868    !TEST-023 USES A DATA PATTERN OF:  "1 000 110 000 000 100" (106004)
3869
3870    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3871
3872    !* PART A *
3873    !TEST-023-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
3874    !AS CLASS-D=SOP*DMO; IR<14:06>H="000 110 000"; IR<15>H="1";
3875    !DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (560)
3876    5717:
3877    TEST023A:
3878            PO,     LOAD-ENUA(ZTARGET560),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3879                    LOAD-ERROR(TEST023A),                   !ERROR DIRECTORY KEY
3880                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
3881            NEXT,   J/LOAD023A                              !GO LOAD PATTERN
    (5717)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.01..110..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.001.100]
3882
3883
3884    5714:
3885    LOAD023A:
3886            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
3887                    EMIT/106004,                            !(106004)
3888            NEXT,   J/GOBUT023A                             !GO SETUP FOR "BUT"
    (5714)  DCS[0.00.0.0.0.0]  BM[1000..00.11..00.00..000..100...0.0.0..0..0...1.1010...0..0000.0...11.000...000.101.011]
3889
3890
3891    5053:  !(FREE)
3892    GOBUT023A:
3893            SETUP,  RETURN/SCOPE023,                        !RETURN TO SCOPE LOOP TEST WORD
3894            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3895                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
```

```
     (5053)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.1101]
3896
3897
3898    5054:  !(FREE)
3899    SCOPE023:
3900            PO,     BUMP-VERIFY,                            !COUNT
3901            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST024A" [+1. WORD]
3902                    J/TEST024A                              !   ERROR:  "LOAD023A" [-2. WORDS]
     (5054)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.001.101]
3903
3904
3905
3906
3907
3908
3909    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3910
3911    !*** TEST 024 ***
3912    !TEST-024 USES A DATA PATTERN OF:  "0 000 101 111 000 110" (005706)
3913
3914    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3915
3916    !* PART A *
3917    !TEST-024-A CHECKS THAT BUT[DR6-7 L] READS THE "11" IN IR<2:1> H CORRECTLY
3918    !AND DOES ASSERT THE SIGNAL
3919    5715:
3920    TEST024A:
3921            PO,     LOAD-ENUA(ZTARGET402),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3922                    LOAD-ERROR(TEST024A),                   !ERROR DIRECTORY KEY
3923                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
3924            NEXT,   J/LOAD024A                              !
     (5715)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.1101]
3925
3926
3927    5706:
3928    LOAD024A:
3929            PO,     BUMP-VERIFY,                            !COUNT
3930            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
3931                    EMIT/005706,                            !(005706)
3932            NEXT,   J/GOBUT024A                             !GO SETUP FOR "BUT"
     (5706)  DCS[0.00.0.0.0.1]  BM[0000..00.10..11.11..000..110...0.0.0..0..0...1.1010...0..0000.0...11.000...000.101.1011]
3933
3934
3935    5055:  !(FREE)
3936    GOBUT024A:
3937            SETUP,  RETURN/TEST024B,                        !RETURN TO START OF NEXT SUBTEST
3938            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3939                    J/BUTDR6-7L                             !GO DO "BUT" ON DR 6/7 L
     (5055)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.1111]
3940
3941
3942    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```
3943
3944    !* PART B *
3945    !TEST-024-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
3946    !AS CLASS-D=SOP*DMO; I<14:06>H="000 101 111"; IR<15>H="0";
3947    !DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (557)
3948    5711:
3949    TEST024B:
3950            PO,     LOAD-ENUA(ZTARGET557),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3951                    LOAD-ERROR(TEST024B),                   !ERROR DIRECTORY KEY
3952                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
3953            NEXT,   J/GOBUT024B                             !GO SETUP FOR "BUT"
    (5711)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.110]
3954
3955
3956    5056:  !(FREE)
3957    GOBUT024B:
3958            SETUP,  RETURN/SCOPE024,                        !RETURN TO SCOPE LOOP TEST WORD
3959            PO,     BUMP-VERIFY,                            !COUNT
3960            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
3961                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5056)  DCS[0.00.0.0.0.1]  BM[0101..00.00..01.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
3962
3963
3964    5057:  !(FREE)
3965    SCOPE024:
3966            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST025A" [+1. WORD]
3967                    J/TEST025A                              !   ERROR:  "LOAD024A" [-4. WORDS]
    (5057)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.111]
3968
3969
3970
3971
3972
3973
3974    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3975
3976    !*** TEST 025 ***
3977    !TEST-025 USES A DATA PATTERN OF:  "0 000 110 011 000 011" (006303)
3978
3979    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
3980
3981    !* PART A *
3982    !TEST-025-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
3983    !AS CLASS-D=SOP*DMO; IR<14:06>H="000 110 011"; IR<15>H="0";
3984    !DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (543)
3985    5707:
3986    TEST025A:
3987            PO,     LOAD-ENUA(ZTARGET543),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
3988                    LOAD-ERROR(TEST025A),                   !ERROR DIRECTORY KEY
3989                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
3990            NEXT,   J/LOAD025A                              !GO LOAD PATTERN
    (5707)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.01..100..011...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.100]
3991
```

```
3992
3993    5704:
3994    LOAD025A:
3995            P2-U,   IR←EMIT,                                        !LOAD IR WITH TEST PATTERN
3996                    EMIT/006303,                                    !(006303)
3997            NEXT,   J/GOBUT025A                                     !GO SETUP FOR "BUT"
     (5704)  DCS[0.00.0.0.0.0]  BM[0000..00.11..00.11..000..011...0.0.0..0..0...1.1010...0..0000.0...11.000...000.110.000]
3998
3999
4000    5060:  !(FREE)
4001    GOBUT025A:
4002            SETUP,  RETURN/SCOPE025,                                !RETURN TO SCOPE LOOP TEST WORD
4003            NEXT,   GOTO-PAGE(7),                                   !BUT TABLE IS ON PAGE 7
4004                    J/BUTINSTR1                                     !GO DO INSTR1 "BUT"
     (5060)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4005
4006
4007    5061:  !(FREE)
4008    SCOPE025:
4009            NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "TEST026A" [+1. WORD]
4010                    J/TEST026A                                      !   ERROR:  "LOAD025A" [-2. WORDS]
     (5061)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.101]
4011
4012
4013
4014
4015
4016
4017    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4018
4019    !*** TEST 026 ***
4020    !TEST-026 USES A DATA PATTERN OF:  "1 000 101 100 000 011" (105403)
4021
4022    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4023
4024    !* PART A *
4025    !TEST-026-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4026    !AS CLASS-D=SOP*DMO; IR<14:06>H="000 101 100"; IR<15>H="1";
4027    !DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (574)
4028    5705:
4029    TEST026A:
4030            P0,     LOAD-ENUA(ZTARGET574),                          !LOAD EXPECTED ADDRESS AFTER "BUT"
4031                    LOAD-ERROR(TEST026A),                           !ERROR DIRECTORY KEY
4032                    DCS-CTR(C4.),                                   !COMPARE ENUA:TNUA IN 4. MICROWORDS
4033                    BUMP-VERIFY,                                    !COUNT
4034            NEXT,   J/LOAD026A                                      !GO LOAD PATTERN
     (5705)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.01..111..100...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.010]
4035
4036
4037    5702:
4038    LOAD026A:
4039            P2-U,   IR←EMIT,                                        !LOAD IR WITH TEST PATTERN
4040                    EMIT/105403,                                    !(105403)
```

```
4041                NEXT,   J/GOBUT026A                                 !GO SETUP FOR "BUT"
     (5702)  DCS[0.00.0.0.0.0]  BM[1000..00.10..11.00..000..011...0.0.0..0..0...1.1010...0..0000.0...11.000...000.110.010]
4042
4043
4044      5062:  !(FREE)
4045      GOBUT026A:
4046                SETUP,  RETURN/SCOPE026,                            !RETURN TO SCOPE LOOP TEST WORD
4047                PD,     BUMP-VERIFY,                                !COUNT
4048                NEXT,   GOTO-PAGE(7),                               !BUT TABLE IS ON PAGE 7
4049                        J/BUTINSTR1                                 !GO DO INSTR1 "BUT"
     (5062)  DCS[0.00.0.0.0.1]  BM[0101..00.00..01.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4050
4051
4052      5063:  !(FREE)
4053      SCOPE026:
4054                NEXT,   BUTD[SCOPE],                                !NO ERROR:  "TEST027A" [+1. WORD]
4055                        J/TEST027A                                  !   ERROR:  "LOAD026A" [-2. WORDS]
     (5063)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.011]
4056
4057
4058
4059
4060
4061
4062      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4063
4064      !*** TEST 027 ***
4065      !TEST-027 USES A DATA PATTERN OF:  "1 000 110 001 000 010" (106102)
4066
4067      !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4068
4069      !* PART A *
4070      !TEST-027-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4071      !AS CLASS-D=SOP*DMO; IR<14:06>H="000 110 001"; IR<15>H="1";
4072      !DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (561)
4073      5703:
4074      TEST027A:
4075                PD,     LOAD-ENUA(ZTARGET561),                      !LOAD EXPECTED ADDRESS AFTER "BUT"
4076                        LOAD-ERROR(TEST027A),                       !ERROR DIRECTORY KEY
4077                        DCS-CTR(C4.),                               !COMPARE ENUA:TNUA IN 4. MICROWORDS
4078                NEXT,   J/LOAD027A                                  !GO LOAD PATTERN
     (5703)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.01..110..001...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.000]
4079
4080
4081      5700:
4082      LOAD027A:
4083                P2-U,   IR←EMIT,                                    !LOAD IR WITH TEST PATTERN
4084                        EMIT/106102,                                !(106102)
4085                NEXT,   J/GOBUT027A                                 !GO SETUP FOR "BUT"
     (5700)  DCS[0.00.0.0.0.0]  BM[1000..00.11..00.01..000..010...0.0.0..0..0...1.1010...0..0000.0...11.000...000.110.100]
4086
4087
4088      5064:  !(FREE)
```

```
4089    GOBUT027A:
4090            SETUP,  RETURN/SCOPE027,                        !RETURN TO SCOPE LOOP TEST WORD
4091            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4092                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5064)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4093
4094    5065:  !(FREE)
4095    SCOPE027:
4096            PD,     BUMP-VERIFY,                            !COUNT
4097            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST030A" [+1. WORD]
4098                    J/TEST030A                              !   ERROR:  "LOAD027A" [-2. WORDS]
    (5065)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.001]
4099
4100
4101
4102
4103
4104
4105    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4106
4107    !*** TEST 030 ***
4108    !TEST-030 USES A DATA PATTERN OF:  "0 000 101 010 000 100" (005204)
4109
4110    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4111
4112    !* PART A *
4113    !TEST-030-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4114    !AS CLASS-D=SOP*DMO; IR<14:06>H="000 101 010"; IR<15>H="0";
4115    !DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (552)
4116    5701:
4117    TEST030A:
4118            PD,     LOAD-ENUA(ZTARGET552),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4119                    LOAD-ERROR(TEST030A),                   !ERROR DIRECTORY KEY
4120                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4121            NEXT,   J/LOAD030A                              !GO LOAD PATTERN
    (5701)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.01..101..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.110]
4122
4123
4124    5676:
4125    LOAD030A:
4126            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4127                    EMIT/005204,                            !(005204)
4128            NEXT,   J/GOBUT030A                             !GO SETUP FOR "BUT"
    (5676)  DCS[0.00.0.0.0.0]  BM[0000..00.10..10.10..000..100...0.0.0..0..0...1.1010...0..0000.0...11.000...000.110.110]
4129
4130
4131    5066:  !(FREE)
4132    GOBUT030A:
4133            SETUP,  RETURN/TEST030B,                        !RETURN TO START OF NEXT SUBTEST
4134            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4135                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5066)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
```

```
4136
4137
4138
4139
4140    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4141
4142    !* PART B *
4143    !TEST-030-B CHECKS THAT BUTIIR<11>#FLTPT<3:0>] READS THE "1" IN IR<11>H CORRECTLY,
4144    !AND THE FLTPT DECODE ROM GETS ADDRESS (240), WHICH IS A MULF/MODE-0 INSTR,
4145    !DATA SHOULD BE (04)
4146    5712:
4147    TEST030B:
4148            PO,     LOAD-ENUA(ZTARGET424),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4149                    LOAD-ERROR(TEST030B),                   !ERROR DIRECTORY KEY
4150                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
4151            NEXT,   J/GOBUT030B                             !
    (5712)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..010..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.111]
4152
4153
4154    5067:  !(FREE)
4155    GOBUT030B:
4156            SETUP,  RETURN/TEST030C,                        !RETURN TO START OF NEXT SUBTEST
4157            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4158                    J/BUTIR11FLTPT3-0                       !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
    (5067)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]
4159
4160
4161    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4162
4163    !* PART C *
4164    !TEST-030-C CHECKS THAT BUTR[IR<11>B] READS THE "1" IN IR<11>H CORRECTLY
4165    5713:
4166    TEST030C:
4167            PO,     LOAD-ENUA(ZTARGET403),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4168                    LOAD-ERROR(TEST030C),                   !ERROR DIRECTORY KEY
4169                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
4170            NEXT,   J/GOBUT030C                             !GO SETUP FOR "BUT"
    (5713)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.000]
4171
4172
4173    5070:  !(FREE)
4174    GOBUT030C:
4175            SETUP,  RETURN/TEST030D,                        !RETURN TO START OF NEXT SUBTEST
4176            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4177                    J/BUTIR11B                              !GO DO "BUT" ON IR<11>H
    (5070)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.010]
4178
4179
4180
4181
4182    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4183
```

```
4184    !* PART D *
4185    !TEST-030-D CHECKS THAT BUT[INSTR5] READS THE IR CORRECILY
4186    !AS ROM ADDRESS=(452) ON THE INSTR5 E78 ROM, AND RECEIVES THE DIAGNOSTIC VALUE
4187    !OF (05), TARGETING TO (405) AFTER THE DECODE
4188    5734:
4189    TEST030D:
4190          PO,     LOAD-ENUA(ZTARGET405),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4191                  LOAD-ERROR(TEST030D),                   !ERROR DIRECTORY KEY
4192                  DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
4193          NEXT,   J/GOBUT030D                             !GO SETUP FOR "BUT"
     (5734)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.001]
4194
4195
4196    5071:  !(FREE)
4197    GOBUT030D:
4198          SETUP,  RETURN/SCOPE030,                        !RETURN TO SCOPE LOOP TEST WORD
4199          NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4200                  J/BUTINSTR5                             !GO DO "BUT" ON INSTR5<4:0>H
     (5071)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
4201
4202
4203    5072:  !(FREE)
4204    SCOPE030:
4205          NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST031A" [+1. WORD]
4206                  J/TEST031A                              !   ERROR:  "LOAD030A" [-8. WORDS]
     (5072)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.111]
4207
4208
4209
4210
4211
4212
4213    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4214
4215    !*** TEST 031 ***
4216    !TEST-031 USES A DATA PATTERN OF:   "0 001 000 010 100 010" (040212)
4217
4218    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4219
4220    !* PART A *
4221    !TEST-031-A CHECKS THAT BUT[DMO#SMO#BYTE]
4222    !DM=IR<5:3>H="100", DMOH=0; SM=IR<11:9>H="000", SMOH=1; BYTE H=0
4223    5677:
4224    TEST031A:
4225          PO,     LOAD-ENUA(ZTARGET402),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4226                  LOAD-ERROR(TEST031A),                   !ERROR DIRECTORY KEY
4227                  DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4228          NEXT,   J/LOAD031A                              !GO LOAD PATTERN
     (5677)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.010]
4229
4230
4231    5672:
4232    LOAD031A:
```

```
4233            P0,     BUMP-VERIFY,                            !COUNT
4234            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4235                    EMIT/010242,                            !(010242)
4236            NEXT,   J/GOBUT031A                             !GO SETUP FOR "BUT"
    (5672)  DCS[0.00.0.0.0.1]  BM[0001..00.00..00.10..100..010...0.0.0..0..0...1.1010...0..0000.0...11.000...000.111.011]
4237
4238
4239    5073:   !(FREE)
4240    GOBUT031A:
4241            SETUP,  RETURN/TEST031B,                        !RETURN TO START OF NEXT SUBTEST
4242            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4243                    J/BUTDMSMBYTE                           !GO DO "BUT"
    (5073)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.011]
4244
4245
4246    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4247
4248    !* PART B *
4249    !TEST-031-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4250    !AS CLASS-C=MOV*SMO*-DMO; IR<14:9>H="001 000"; IR<15>H="0";
4251    !DM=IR<5:3>H="100"; AND TARGETS TO (604)
4252    5675:
4253    TEST031B:
4254            P0,     LOAD-ENUA(ZTARGET604),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4255                    LOAD-ERROR(TEST031B),                   !ERROR DIRECTORY KEY
4256                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
4257            NEXT,   J/GOBUT031B                             !GO SETUP FOR "BUT"
    (5675)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.10..000..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.100]
4258
4259
4260    5074:   !(FREE)
4261    GOBUT031B:
4262            SETUP,  RETURN/SCOPE031,                        !RETURN TO SCOPE LOOP TEST WORD
4263            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4264                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5074)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4265
4266
4267    5075:   !(FREE)
4268    SCOPE031:
4269            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST032A" [+1. WORDS]
4270                    J/TEST032A                              !   ERROR:  "LOAD031A" [-4. WORDS]
    (5075)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.011]
4271
4272
4273
4274
4275
4276
4277    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4278
4279    !*** TEST 032 ***
```

```
4280    !TEST-032 USES A DATA PATTERN OF: "1 001 000 001 010 101" (110125)
4281
4282    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
4283
4284    !* PART A *
4285    !TEST-032-A CHECKS THAT BUT[MOV-DR7*IR<5:3>] READS THE (-FLTPT*MOV+FLTPT*DR7) AND
4286    !ALTERNATING PATTERN "010" IN IR<5:3>H CORRECTLY
4287    5673:
4288    TEST032A:
4289            P0,     LOAD-ENUA(ZTARGET412),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4290                    LOAD-ERROR(TEST032A),                   !ERROR DIRECTORY KEY
4291                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4292                    BUMP-VERIFY,                            !COUNT
4293            NEXT,   J/LOAD032A                              !GO LOAD PATTERN
    (5673)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.110]
4294
4295
4296    5666:
4297    LOAD032A:
4298            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4299                    EMIT/110125,                            !(110125)
4300            NEXT,   J/GOBUT032A                             !GO SETUP FOR "BUT"
    (5666)  DCS[0.00.0.0.0.0]  BM[1001..00.00..00.01..010..101...0.0.0..0..0...1.1010...0..0000.0...11.000...000.111.110]
4301
4302
4303    5076:  !(FREE)
4304    GOBUT032A:
4305            SETUP,  RETURN/TEST032B,                        !RETURN TO START OF NEXT SUBTEST
4306            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4307                    J/BUTMOVDR7IR5-3                        !GO DO "BUT"
    (5076)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.101]
4308
4309
4310    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
4311
4312    !* PART B *
4313    !TEST-032-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4314    !AS CLASS-C=MOV*SMD*-DMD; IR<14:9>H="001 000"; IR<15>H="1";
4315    !DM=IR<5:3>H="010"; AND TARGETS TO (612)
4316    5671:
4317    TEST032B:
4318            P0,     LOAD-ENUA(ZTARGET612),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4319                    LOAD-ERROR(TEST032B),                   !ERROR DIRECTORY KEY
4320                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
4321            NEXT,   J/GOBUT032B                             !GO SETUP FOR "BUT"
    (5671)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.10..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.111]
4322
4323
4324    5077:  !(FREE)
4325    GOBUT032B:
4326            SETUP,  RETURN/SCOPE032,                        !RETURN TO SCOPE LOOP TEST WORD
4327            P0,     BUMP-VERIFY,                            !COUNT
4328            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
```

```
4329                    J/BUTINSTR1                                     !GO DO INSTR1 "BUT"
     (5077)  DCS[0.00.0.0.0.1]  BM[C101..00.00..10.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4330
4331
4332     5100:  !(FREE)
4333     SCOPE032:
4334             NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "TEST033A" [+1. WORDS]
4335                     J/TEST033A                                      !   ERROR:  "LOAD032A" [-4. WORDS]
     (5100)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.111]
4336
4337
4338
4339
4340
4341
4342     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4343
4344     !*** TEST 033 ***
4345     !TEST-033 USES A DATA PATTERN OF:  "1 000 110 010 111 100" (106274)
4346
4347     !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4348
4349     !* PART A *
4350     !TEST-033-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4351     !AS CLASS-B=SOP*-DMO; IR<14:08>H="000 110 0";
4352     !DM=IR<5:3>H="111", DMOH=0; AND TARGETS TO (517)
4353     5667:
4354     TEST033A:
4355             PO,     LOAD-ENUA(ZTARGET517),                          !LOAD EXPECTED ADDRESS AFTER "BUT"
4356                     LOAD-ERROR(TEST033A),                           !ERROR DIRECTORY KEY
4357                     DCS-CTR(C4.),                                   !COMPARE ENUA:TNUA IN 4. MICROWORDS
4358                     BUMP-VERIFY,                                    !COUNT
4359             NEXT,   J/LOAD033A                                      !GO LOAD PATTERN
     (5667)  DCS[1.00.1.0.0.1]  BM[1011..00.11..1 .01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.100]
4360
4361
4362     5664:
4363     LOAD033A:
4364             P2-U,   IR←EMIT,                                        !LOAD IR WITH TEST PATTERN
4365                     EMIT/106274,                                    !(106274)
4366             NEXT,   J/GOBUT033A                                     !GO SETUP FOR "BUT"
     (5664)  DCS[0.00.0.0.0.0]  BM[1000..00.11..00.10..111..100...0.0.0..0..0...1.1010...0..0000.0...11.000...001.000.001]
4367
4368
4369     5101:  !(FREE)
4370     GOBUT033A:
4371             SETUP,  RETURN/SCOPE033,                                !RETURN TO SCOPE LOOP TEST WORD
4372             P0,     BUMP-VERIFY,                                    !COUNT
4373             NEXT,   GOTO-PAGE(7),                                   !BUT TABLE IS ON PAGE 7
4374                     J/BUTINSTR1                                     !GO DO INSTR1 "BUT"
     (5101)  DCS[0.00.0.0.0.1]  BM[0101..00.00..10.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4375
```

```
4376
4377    5102:  !(FREE)
4378    SCOPE033:
4379            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST034A" [+1. WORD]
4380                    J/TEST034A                              !   ERROR:  "LOAD033A" [-2. WORDS]
     (5102)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.101]
4381
4382
4383
4384
4385
4386    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4387
4388    !*** TEST 034 ***
4389    !TEST-034 USES A DATA PATTERN OF:  "0 000 101 001 001 010" (005112)
4390
4391    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4392
4393    !* PART A *
4394    !TEST-034-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4395    !AS CLASS-B=SOP*-DM0; IR<14:09>H="000 101";
4396    !DM=IR<5:3>H="001", DM0H=0; AND TARGETS TO (511)
4397    5665:
4398    TEST034A:
4399            P0,     LOAD-ENUA(ZTARGET511),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4400                    LOAD-ERROR(TEST034A),                   !ERROR DIRECTORY KEY
4401                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4402            NEXT,   J/LOAD034A                              !GO LOAD PATTERN
     (5665)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.01..001..001...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.010]
4403
4404
4405    5662:
4406    LOAD034A:
4407            P0,     BUMP-VERIFY,                            !COUNT
4408            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4409                    EMIT/005112,                            !(005112)
4410            NEXT,   J/GOBUT034A                             !GO SETUP FOR "BUT"
     (5662)  DCS[0.00.0.0.0.1]  BM[0000..00.10..10.01..001..010...0.0.0..0..0...1.1010...0..0000.0...11.000...001.000.011]
4411
4412
4413    5103:  !(FREE)
4414    GOBUT034A:
4415            SETUP,  RETURN/SCOPE034,                        !RETURN TO SCOPE LOOP TEST WORD
4416            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4417                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
     (5103)  DCS[0.00.0.0.0.0]  BM[0101..00.00..10.00..100..11...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4418
4419
4420    5104:  !(FREE)
4421    SCOPE034:
4422            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST035A" [+1. WORD]
4423                    J/TEST035A                              !   ERROR:  "LOAD034A" [-2. WORDS]
     (5104)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.011]
```

```
4424
4425
4426
4427
4428
4429
4430    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4431
4432    !*** TEST 035 ***
4433    !TEST-035 USES A DATA PATTERN OF:  "0 011 000 111 000 001" (030701)
4434
4435    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4436
4437    !* PART A *
4438    !TEST-035-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4439    !AS CLASS-A=DOP*SMO*DMO; IR<15:12>H="0011";
4440    !SM=IR<11:9>H="000", SMOH=1; DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (443)
4441    5663:
4442    TEST035A:
4443            PO,     LOAD-ENUA(ZTARGET443),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4444                    LOAD-ERROR(TEST035A),                   !ERROR DIRECTORY KEY
4445                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4446            NEXT,   J/LOAD035A                              !GO LOAD PATTERN
    (5663)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..100..011...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.000]
4447
4448
4449    5660:
4450    LOAD035A:
4451            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4452                    EMIT/030701,                            !(030701)
4453            NEXT,   J/GOBUT035A                             !GO SETUP FOR "BUT"
    (5660)  DCS[0.00.0.0.0.0]  BM[0011..00.00..01.11..000..001...0.0.0..0..0...1.1010...0..0000.0...11.000...001.000.101]
4454
4455
4456    5105:  !(FREE)
4457    GOBUT035A:
4458            SETUP,  RETURN/SCOPE035,                        !RETURN TO SCOPE LOOP TEST WORD
4459            PO,     BUMP-VERIFY,                            !COUNT
4460            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4461                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5105)  DCS[0.00.0.0.0.1]  BM[0101..00.00..10.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4462
4463
4464    5106:  !(FREE)
4465    SCOPE035:
4466            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST036A" [+1. WORD]
4467                    J/TEST036A                              !   ERROR:  "LOAD035A" [-2. WORDS]
    (5106)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.001]
4468
4469
4470
4471
4472
```

```
4473
4474    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4475
4476    !*** TEST 036 ***
4477    !TEST-036 USES A DATA PATTERN OF:  "1 101 000 101 000 110" (150506)
4478
4479    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4480
4481    !* PART A *
4482    !TEST-036-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4483    !AS CLASS-A=DOP*SMO*DMO; IR<15:12>H="1101";
4484    !SM=IR<11:9>H="000", SMOH=1; DM=IR<5:3>H="000", DMOH=1; AND TARGETS TO (455)
4485    5661:
4486    TEST036A:
4487            PO,     LOAD-ENUA(ZTARGET455),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4488                    LOAD-ERROR(TEST036A),                   !ERROR DIRECTORY KEY
4489                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4490            NEXT,   J/LOAD036A                              !GO LOAD PATTERN
    (5661)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..101..101...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.110]
4491
4492
4493    5656:
4494    LOAD036A:
4495            PO,     BUMP-VERIFY,                            !COUNT
4496            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4497                    EMIT/150506,                            !(150506)
4498            NEXT,   J/GOBUT036A                             !GO SETUP FOR "BUT"
    (5656)  DCS[0.00.0.0.0.1]  BM[1101..00.00..01.01..000..110...0.0.0..0..0...1.1010...0..0000.0...11.000...001.000.111]
4499
4500
4501    5107:  !(FREE)
4502    GOBUT036A:
4503            SETUP,  RETURN/SCOPE036,                        !RETURN TO SCOPE LOOP TEST WORD
4504            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4505                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5107)  DCS[0.00.0.0.0.0]  BM[0101..00.00..10.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4506
4507
4508
4509    5110:  !(FREE)
4510    SCOPE036:
4511            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST037A" [+1. WORD]
4512                    J/TEST037A                              !   ERROR:  "LOAD036A" [-2. WORDS]
    (5110)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.111]
4513
4514
4515
4516
4517
4518
4519    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4520
4521    !*** TEST 037 ***
```

```
4522    !TEST-037 USES A DATA PATTERN OF:  "0 110 000 010 000 101" (060205)
4523
4524    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4525
4526    !* PART A *
4527    !TEST-037-A CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4528    !AS CLASS-A=DOP*SMO*DMO; IR<15:12>H="0110";
4529    !SM=IR<11:9>H="000", SMOH=1; DM=IR<5:3>H="000", DMO=1; AND TARGETS TO (446)
4530    5657:
4531    TEST037A:
4532            PO,     LOAD-ENUA(ZTARGET446),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4533                    LOAD-ERROR(TEST037A),                   !ERROR DIRECTORY KEY
4534                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4535            NEXT,   J/LOAD037A                              !GO LOAD PATTERN
    (5657)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..100..110...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.100]
4536
4537
4538    5654:
4539    LOAD037A:
4540            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4541                    EMIT/060205,                            !(060205)
4542            NEXT,   J/GOBUT037A                             !GO SETUP FOR "BUT"
    (5654)  DCS[0.00.0.0.0.0]  BM[0110..00.00..00.10..000..101...0.0.0..0..0...1.1010...0..0000.0...11.000...001.001.001]
4543
4544
4545    5111:  !(FREE)
4546    GOBUT037A:
4547            SETUP,  RETURN/SCOPE037,                        !RETURN TO SCOPE LOOP TEST WORD
4548            PO,     BUMP-VERIFY,                            !COUNT
4549            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4550                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5111)  DCS[0.00.0.0.0.1]  BM[0101..00.00..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4551
4552
4553    5112:  !(FREE)
4554    SCOPE037:
4555            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST040A" [+1. WORD]
4556                    J/TEST040A                              !   ERROR:  "LOAD037A" [-2. WORDS]
    (5112)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.101]
4557
4558
4559
4560
4561
4562
4563    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4564
4565    !*** TEST 040 ***
4566    !TEST-040 USES A DATA PATTERN OF:  "0 101 000 111 111 111 " (050777)
4567
4568    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4569
4570    !* PART A *
```

```
4571    !TEST-040-A CHECKS THAT BUT [IR<15:12>] READS THE
4572    !ALTERNATING PATTERN "0101" IN IR<15:12>H CORRECTLY
4573    5655:
4574    TEST040A:
4575            PD,     LOAD-ENUA(ZTARGET405),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4576                    LOAD-ERROR(TEST040A),                   !ERROR DIRECTORY KEY
4577                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4578            NEXT,   J/LOAD040A                              !GO LOAD PATTERN
    (5655)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.000]
4579
4580
4581    5650:
4582    LOAD040A:
4583            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4584                    EMIT/050777,                            !(050777)
4585            NEXT,   J/GOBUT040A                             !GO SETUP FOR "BUT"
    (5650)  DCS[0.00.0.0.0.0]  BM[0101..00.00..01.11..111..111...0.0.0..0..0...1.1010...0..0000.0...11.000...001.001.011]
4586
4587
4588    5113:  !(FREE)
4589    GOBUT040A:
4590            SETUP,  RETURN/TEST040B,                        !RETURN TO START OF NEXT SUBTEST
4591            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4592                    J/BUTIR15-12                            !GO DO "BUT"
    (5113)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.000]
4593
4594
4595    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4596
4597    !* PART B *
4598    !TEST-040-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4599    !AS CLASS-B=DOP*-MOV*SMO*-DMO; DM=IR<5:3>H="111";
4600    !DOP=IR<14:12>H="101"; TARGETS TO (517)
4601    5653:
4602    TEST040B:
4603            PD,     LOAD-ENUA(ZTARGET517),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4604                    LOAD-ERROR(TEST040B),                   !ERROR DIRECTORY KEY
4605                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
4606                    BUMP-VERIFY,                            !COUNT
4607            NEXT,   J/GOBUT040B                             !GO SETUP FOR "BUT"
    (5653)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.100]
4608
4609
4610    5114:  !(FREE)
4611    GOBUT040B:
4612            SETUP,  RETURN/SCOPE040,                        !RETURN TO SCOPE LOOP TEST WORD
4613            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4614                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5114)  DCS[0.00.0.0.0.0]  BM[0101..00.00..10.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4615
4616
4617    5115:  !(FREE)
```

```
4618    SCOPE040:
4619            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST041A" [+1. WORDS]
4620                    J/TEST041A                              !   ERROR:  "LOAD040A" [-4. WORDS]
    (5115)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.001]
4621
4622
4623
4624
4625
4626
4627    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4628
4629    !*** TEST 041 ***
4630    !TEST-041 USES A DATA PATTERN OF:  "1 010 000 111 111 111 " (120777)
4631
4632    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4633
4634    !* PART A *
4635    !TEST-041-A CHECKS THAT BUT[IR<15:12>] READS THE
4636    !ALTERNATING PATTERN "1010" IN IR<15:12>H CORRECTLY
4637    5651:
4638    TEST041A:
4639            PO,     LOAD-ENUA(ZTARGET412),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4640                    LOAD-ERROR(TEST041A),                   !ERROR DIRECTORY KEY
4641                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4642            NEXT,   J/LOAD041A                              !GO LOAD PATTERN
    (5651)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.100]
4643
4644
4645    5644:
4646    LOAD041A:
4647            PO,     BUMP-VERIFY,                            !COUNT
4648            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4649                    EMIT/120777,                            !(120777)
4650            NEXT,   J/GOBUT041A                             !GO SETUP FOR "BUT"
    (5644)  DCS[0.00.0.0.0.1]  BM[1010..00.00..01.11..111..111...0.0.0..0..0...1.1010...0..0000.0...11.000...001.001.110]
4651
4652
4653    5116:  !(FREE)
4654    GOBUT041A:
4655            SETUP,  RETURN/TEST041B,                        !RETURN TO START OF NEXT SUBTEST
4656            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4657                    J/BUTIR15-12                            !GO DO "BUT"
    (5116)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.000]
4658
4659
4660    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4661
4662    !* PART B *
4663    !TEST041-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4664    !AS CLASS-B=DOP*-MOV*SMD*-DMD; DM=IR<5:3>H="111";
4665    !DOP=IR<14:12>H="010"; TARGETS TO (517)
4666    5647:
```

```
4667    TEST041B:
4668            PO,     LOAD-ENUA(ZTARGET517),                  !LOAD EXPECIED ADDRESS AFTER "BUT"
4669                    LOAD-ERROR(TEST041B),                   !ERROR DIRECTORY KEY
4670                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
4671                    BUMP-VERIFY,                            !COUNT
4672            NEXT,   J/GOBUT041B                             !GO SETUP FOR "BUT"
     (5647)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.111]
4673
4674
4675    5117:  !(FREE)
4676    GOBUT041B:
4677            SETUP,  RETURN/SCOPE041,                        !RETURN TO SCOPE LOOP TEST WORD
4678            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4679                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
     (5117)  DCS[0.00.0.0.0.0]  BM[0101..00.00..10.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4680
4681
4682    5120:  !(FREE)
4683    SCOPE041:
4684            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST042A" [+1. WORDS]
4685                    J/TEST042A                              !   ERROR:  "LOAD041A" [-4. WORDS]
     (5120)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.101]
4686
4687
4688
4689
4690
4691
4692    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4693
4694    !*** TEST 042 ***
4695    !TEST-042 USES A DATA PATTERN OF:  "1 100 100 000 010 000" (144020)
4696
4697    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4698
4699    !* PART A *
4700    !TEST-042-A CHECKS THAT BUT[DMO#SMO#BYTE]
4701    !DM=IR<5:3>H="010", DMOH=0; SM=IR<11:9>H="100", SMOH=0; BYTE H=1
4702    5645:
4703    TEST042A:
4704            PO,     LOAD-ENUA(ZTARGET401),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4705                    LOAD-ERROR(TEST042A),                   !ERROR DIRECTORY KEY
4706                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4707            NEXT,   J/LOAD042A                              !GO LOAD PATTERN
     (5645)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.000]
4708
4709
4710    5640:
4711    LOAD042A:
4712            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4713                    EMIT/144020,                            !(144020)
4714            NEXT,   J/GOBUT042A                             !GO SETUP FOR "BUT"
     (5640)  DCS[0.00.0.0.0.0]  BM[1100..00.10..00.00..010..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.010.001]
```

```
4715
4716
4717    5121:  !(FREE)
4718    GOBUT042A:
4719            SETUP,  RETURN/TEST042B,                        !RETURN TO START OF NEXT SUBTEST
4720            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4721                    J/BUTDMSMBYTE                           !GO DO "BUT"
    (5121)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.011]
4722
4723
4724    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4725
4726    !* PART B *
4727    !TEST-042-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4728    !AS CLASS-G=DOP*-SMO; DOP=IR<14:12>H="100";
4729    !SM=IR<11:9>H="100"; TARGETS TO (714)
4730    5643:
4731    TEST042B:
4732            PO,     LOAD-ENUA(ZTARGET714),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4733                    LOAD-ERROR(TEST042B),                   !ERROR DIRECTORY KEY
4734                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
4735            NEXT,   J/GOBUT042B                             !GO SETUP FOR "BUT"
    (5643)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.11..001..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.010]
4736
4737
4738    5122:  !(FREE)
4739    GOBUT042B:
4740            SETUP,  RETURN/SCOPE042,                        !RETURN TO SCOPE LOOP TEST WORD
4741            PO,     BUMP-VERIFY,                            !COUNT
4742            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4743                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5122)  DCS[0.00.0.0.0.1]  BM[0101..00.00..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4744
4745
4746    5123:  !(FREE)
4747    SCOPE042:
4748            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST043A" [+1. WORDS]
4749                    J/TEST043A                              !   ERROR:  "LOAD042A" [-4. WORDS]
    (5123)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.001]
4750
4751
4752
4753
4754
4755
4756    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4757
4758    !*** TEST 043 ***
4759    !TEST-043 USES A DATA PATTERN OF:  "1 110 001 111 000 111" (161707)
4760
4761    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4762
```

```
4763    !* PART A *
4764    !TEST-043-A CHECKS THAT BUT[DMO*SMO*BYTE]
4765    !DM=IR<5:3>H="000", DMOH=1; SM=IR<11:9>H="001", SMOH=0; BYTE H=0
4766    5641:
4767    TEST043A:
4768            PO,     LOAD-ENUA(ZTARGET404),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4769                    LOAD-ERROR(TEST043A),                   !ERROR DIRECTORY KEY
4770                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4771            NEXT,   J/LOAD043A                              !GO LOAD PATTERN
    (5641)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.100]
4772
4773
4774    5634:
4775    LOAD043A:
4776            PO,     BUMP-VERIFY,                            !COUNT
4777            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4778                    EMIT/161707,                            !(161707)
4779            NEXT,   J/GOBUT043A                             !GO SETUP FOR "BUT"
    (5634)  DCS[0.00.0.0.0.1]  BM[1110..00.00..11.11..000..111...0.0.0..0..0...1.1010...0..0000.0...11.000...001.010.100]
4780
4781
4782    5124:  !(FREE)
4783    GOBUT043A:
4784            SETUP,  RETURN/TEST043B,                        !RETURN TO START OF NEXT SUBTEST
4785            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4786                    J/BUTDMSMBYTE                           !GO DO "BUT"
    (5124)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.011]
4787
4788
4789    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
4790
4791    !* PART B *
4792    !TEST-043-B CHECKS THAT BUT[INSTR1] READS THE IR CORRECTLY
4793    !AS CLASS-G=DOP*-SMO; DOP=IR<14:12>H="110";
4794    !SM=IR<11:9>H="001"; TARGETS TO (711)
4795    5637:
4796    TEST043B:
4797            PO,     LOAD-ENUA(ZTARGET711),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4798                    LOAD-ERROR(TEST043B),                   !ERROR DIRECTORY KEY
4799                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
4800            NEXT,   J/GOBUT043B                             !GO SETUP FOR "BUT"
    (5637)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.11..001..001...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.101]
4801
4802
4803    5125:  !(FREE)
4804    GOBUT043B:
4805            SETUP,  RETURN/SCOPE043,                        !RETURN TO SCOPE LOOP TEST WORD
4806            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4807                    J/BUTINSTR1                             !GO DO INSTR1 "BUT"
    (5125)  DCS[0.00.0.0.0.0]  BM[0101..00.00..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
4808
4809
```

```
4810    5126:  !(FREE)
4811    SCOPE043:
4812            PO,     BUMP-VERIFY,                            !COUNT
4813            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST044A" [+1. WORDS]
4814                    J/TEST044A                              !   ERROR:  "LOAD043A" [-4. WORDS]
    (5126)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.101]
4815
4816
4817
4818
4819
4820
4821
4822    ! - - -
```

```
      (5130)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.011]
 4859
 4860
 4861
 4862
 4863
 4864
 4865
 4866    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 4867
 4868    !*** TEST 045 ***
 4869    !TEST-045 USES A DATA PATTERN OF:  "0 000 100 011 000 000" (004300)
 4870
 4871    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 4872
 4873    !* PART A *
 4874    !TEST-045-A CHECKS THAT BUT[DM*SM*BYTE] READS THE IR CORRECTLY AS:
 4875    !DM H="000", DMOH=1;  SM H="100", SMOH=0;  BYTE H=1  (IR=SWAB, SORT OF)
 4876    !CHECKS THAT SWAB INSTR ASSERTS BYTE H
 4877    5633:
 4878    TEST045A:
 4879            PO,     LOAD-ENUA(ZTARGET405),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
 4880                    LOAD-ERROR(TEST045A),                   !ERROR DIRECTORY KEY
 4881                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
 4882            NEXT,   J/LOAD045A                              !GO LOAD PATTERN
      (5633)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.000]
 4883
 4884
 4885    5630:
 4886    LOAD045A:
 4887            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
 4888                    EMIT/004300,                            !(004300)
 4889            NEXT,   J/GOBUT045A                             !GO SETUP FOR "BUT"
      (5630)  DCS[0.00.0.0.0.0]  BM[0000..00.10..00.11..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.011.001]
 4890
 4891
 4892    5131:  !(FREE)
 4893    GOBUT045A:
 4894            SETUP,  RETURN/SCOPE045,                        !RETURN TO SCOPE LOOP TEST WORD
 4895            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
 4896                    J/BUTDMSMBYTE                           !GO DO BUT ON DM*SM*BYTE
      (5131)  DCS[0.00.0.0.0.0]  BM[0101..00.00..10.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.011]
 4897
 4898
 4899    5132:  !(FREE)
 4900    SCOPE045:
 4901            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST046A"  [+1. WORD]
 4902                    J/TEST046A                              !   ERROR:  "LOAD045A" [-2. WORDS]
      (5132)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.001]
 4903
 4904
 4905
 4906
```

```
4907
4908    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4909
4910    !*** TEST 046 ***
4911    !TEST-046 USES A DATA PATTERN OF:  "0 000 000 010 000 000" (000200)
4912
4913    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4914
4915    !* PART A *
4916    !TEST-046-A CHECKS THAT BUT[INSTRS] READS THE IR CORRECTLY
4917    !AS ROM ADDRESS=(426) ON THE INSTRS E88 ROM, AND RECEIVES THE VALUE
4918    !OF (06), TARGETING TO (426) AFTER THE DECODE
4919    5631:
4920    TEST046A:
4921            P0,     LOAD-ENUA(ZTARGET426),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4922                    LOAD-ERROR(TEST046A),                   !ERROR DIRECTORY KEY
4923                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4924            NEXT,   J/LOAD046A                              !GO LOAD PATTERN
    (5631)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..010..110...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.000]
4925
4926
4927    5560:
4928    LOAD046A:
4929            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4930                    EMIT/000200,                            !(000200)
4931            NEXT,   J/GOBUT046A                             !GO SETUP FOR "BUT"
    (5560)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.011.011]
4932
4933
4934    5133:  !(FREE)
4935    GOBUT046A:
4936            SETUP,  RETURN/TEST046B,                        !RETURN TO START OF NEXT SUBTEST
4937            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4938                    J/BUTINSTRS                             !GO DO INSTRS "BUT"
    (5133)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
4939
4940
4941
4942
4943    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4944
4945    !* PART B *
4946    !TEST-046-B CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "0" IN IR<11>H CORRECTLY,
4947    !AND THE FLTPT DECODE ROM GETS ADDRESS (040), WHICH IS A STST INSTR,
4948    !DATA SHOULD BE (01)
4949    5770:
4950    TEST046B:
4951            P0,     LOAD-ENUA(ZTARGET401),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4952                    LOAD-ERROR(TEST046B),                   !ERROR DIRECTORY KEY
4953                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
4954            NEXT,   J/GOBUT046B                             !
    (5770)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.100]
4955
```

```
4956
4957    5134:  !(FREE)
4958    GOBUT046B:
4959            SETUP,  RETURN/SCOPE046,                        !RETURN TO SCOPE LOOP TEST WORD
4960            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
4961                    J/BUTIR11FLTPT3-0                       !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
    (5134)  DCS[0.00.0.0.0.0]  BM[0101..00.00..10.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]
4962
4963
4964
4965
4966    5135:  !(FREE)
4967    SCOPE046:
4968            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST047A" [+1. WORD]
4969                    J/TEST047A                              !   ERROR:  "LOAD046A" [-4. WORDS]
    (5135)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.001]
4970
4971
4972
4973
4974
4975
4976    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4977
4978    !*** TEST 047 ***
4979    !TEST-047 USES A DATA PATTERN OF:  "1 010 010 101 110 110" (122566)
4980
4981    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
4982
4983    !* PART A *
4984    !TEST-047-A CHECKS THAT BUT[INSTRS] READS THE IR CORRECTLY
4985    !AS ROM ADDRESS=(325) ON THE INSTRS E78 ROM, AND RECEIVES THE DIAGNOSTIC VALUE
4986    !OF (12), TARGETING TO (412) AFTER THE DECODE
4987    5561:
4988    TEST047A:
4989            PO,     LOAD-ENUA(ZTARGET412),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
4990                    LOAD-ERROR(TEST047A),                   !ERROR DIRECTORY KEY
4991                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
4992                    BUMP-VERIFY,                            !COUNT
4993            NEXT,   J/LOAD047A                              !GO LOAD PATTERN
    (5561)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.101.000]
4994
4995
4996    5550:
4997    LOAD047A:
4998            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
4999                    EMIT/122566,                            !(122566)
5000            NEXT,   J/GOBUT047A                             !GO SETUP FOR "BUT"
    (5550)  DCS[0.00.0.0.0.0]  BM[1010..00.01..01.01..110..110...0.0.0..0..0...1.1010...0..0000.0...11.000...001.011.110]
5001
5002
5003    5136:  !(FREE)
5004    GOBUT047A:
```

```
5005            SETUP,  RETURN/TEST047B,                        !RETURN TO START OF NEXT SUBTEST
5006            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
5007                    J/BUTINSTRS                             !GO DO INSTRS "BUT"
     (5136)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
5008
5009
5010
5011
5012    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5013
5014    !* PART B *
5015    !TEST-047-B CHECKS THAT BUT[IR<11>#FLTPT<3:0>] READS THE "0" IN IR<11>H CORRECTLY,
5016    !AND THE FLTPT DECODE ROM GETS ADDRESS (534), WHICH IS A LOAD/MODE-6 INSTR,
5017    !DATA SHOULD BE (13)
5018    5670:
5019    TEST047B:
5020            PO,     LOAD-ENUA(ZTARGET413),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
5021                    LOAD-ERROR(TEST047B),                   !ERROR DIRECTORY KEY
5022                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
5023            NEXT,   J/GOBUT047B                             !
     (5670)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.111]
5024
5025
5026    5137:  !(FREE)
5027    GOBUT047B:
5028            PO,     BUMP-VERIFY,                            !COUNT
5029            SETUP,  RETURN/TEST047C,                        !RETURN TO START OF NEXT SUBTEST
5030            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
5031                    J/BUTIR11FLTPT3-0                       !GO DO "BUT" ON IR<11>H#FLTPT<3:0>H
     (5137)  DCS[0.00.0.0.0.1]  BM[0101..00.11..10.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.010]
5032
5033
5034    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5035
5036    !* PART C *
5037    !TEST-047-C CHECKS THAT BUT[MOV-DR7#IR<5:3>] READS THE -(-FLTPT*MOV+FLTPT*DR7), IR<5:3>="110"
5038    5730:
5039    TEST047C:
5040            PO,     LOAD-ENUA(ZTARGET406),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
5041                    LOAD-ERROR(TEST047C),                   !ERROR DIRECTORY KEY
5042                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA IN 3. MICROWORDS
5043            NEXT,   J/GOBUT047C                             !GO SETUP FOR "BUT"
     (5730)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.000]
5044
5045
5046    5140:  !(FREE)
5047    GOBUT047C:
5048            SETUP,  RETURN/SCOPE047,                        !RETURN TO SCOPE LOOP TEST WORD
5049            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
5050                    J/BUTMOVDR7IR5-3                        !GO DO "BUT" ON (MOV/DR7)#IR<5:3>H
     (5140)  DCS[0.00.0.0.0.0]  BM[0101..00.00..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.101]
```

```
5051
5052
5053
5054
5055    5141:  !(FREE)
5056    SCOPE047:
5057            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST050A" [+1. WORD]
5058                    J/TEST050A                              !   ERROR:  "LOAD047A" [-6. WORDS]
    (5141)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.101.001]
5059
5060
5061
5062
5063
5064    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5065
5066    !*** TEST 050 ***
5067    !TEST-050-A USES A DATA PATTERN OF:  "1 111 010 101 000 000" (172500)
5068    !TEST-050-B USES A DATA PATTERN OF:  "1 111 101 010 000 000" (175200)
5069
5070    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5071
5072    !* PART A *
5073    !TEST-050-A CHECKS THAT BUT[INSTR5] READS THE IR CORRECTLY
5074    !AS ROM ADDRESS=(725) ON THE INSTR5 E78 ROM, AND RECEIVES THE DIAGNOSTIC VALUE
5075    !OF (05), TARGETING TO (405) AFTER THE DECODE
5076    5551:
5077    TEST050A:
5078            PO,     LOAD-ENUA(ZTARGET405),                  !LOAD EXPECTED ADDRESS AFTER "BUT"
5079                    LOAD-ERROR(TEST050A),                   !ERROR DIRECTORY KEY
5080                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA IN 4. MICROWORDS
5081                    BUMP-VERIFY,                            !COUNT
5082            NEXT,   J/LOAD050A                              !GO LOAD PATTERN
    (5551)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...101.101.010]
5083
5084
5085    5552:
5086    LOAD050A:
5087            P2-U,   IR←EMIT,                                !LOAD IR WITH TEST PATTERN
5088                    EMIT/172500,                            !(172500)
5089            NEXT,   J/GOBUT050A                             !GO SETUP FOR "BUT"
    (5552)  DCS[0.00.0.0.0.0]  BM[1111..00.01..01.01..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.100.010]
5090
5091
5092    5142:  !(FREE)
5093    GOBUT050A:
5094            SETUP,  RETURN/TEST050B,                        !RETURN TO START OF NEXT SUBTEST
5095            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
5096                    J/BUTINSTR5                             !GO DO INSTR5 "BUT"
    (5142)  DCS[0.00.0.0.0.0]  BM[0101..00.11..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
5097
5098
5099
```

```
5100
5101    ! - - -
```

```
5149    !*
5150    !*      TEST 101 FIRST VERIFIES THE "D -> DBUF -> IR" DATA PATH, INSURING THAT THE
5151    !*      DBUF LATCH CAN BE WRITTEN WITH ZEROES, AND ENABLED ONTO BUSDIN, TO BE PUT
5152    !*      INTO THE IR AND VERIFIED (VIA INSTR5 DECODE, AS A HALT INSTRUCTION).
5153    !*
5154    !*      TESTS 102-104 THEN GO ON TO FURTHER TEST THE FULL DATAPATH FROM EMIT TO
5155    !*      IR, VIA THE EXTENDED ROUTE.  THESE TESTS THEN VERIFY THE CSP WRITE, ADDRESSING AND
5156    !*      DATAPATHS LOGIC.
5157    !*
5158    !*****************************************************************************************
5159
5160    5553:
5161    TEST101A:
5162            PC,     LOAD-ENUA(ZTARGET434),                  !INSTR5 E88 OUTPUT FOR IR=(000000)
5163                    LOAD-ERROR(TEST101A),                   !ERROR DIRECTORY KEY
5164                    DCS-CTR(C7.),                           !COMPARE AT TARGET
5165            NEXT,   J/LOADD101A                             !
    (5553)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.000]
5166
5167    5520:
5168    LOADD101A:
5169            P2-T,   D←ZERO,                                 !PUT (000000) IN D
5170            NEXT,   J/GOTEST101A                            !
    (5520)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...001.100.111]
5171
5172    5147:  !(FREE)
5173    GOTEST101A:
5174            SETUP,  RETURN/SCOPE101,                        !GOT TO SUBR THAT:
5175            NEXT,   CALL[DINTOIR-5]                         !D -> DBUF -> IR, THEN BUT(INSTR5)
    (5147)  DCS[0.00.0.0.0.0]  BM[0101..00.00..11.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
5176
5177
5178
5179    5150:  !(FREE)
5180    SCOPE101:
5181            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST102A"  (+1. WORDS)
5182                    J/TEST102A                              !   ERROR:  "LOADCSP101A"  (-3. WORDS)
    (5150)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.001]
5183
5184
5185    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5186
5187
5188    .TOC    *    TEST102-104:  TESTING CSP ADDRESS/READ/WRITE FUNCTIONS
5189
5190    !THE FOLLOWING SET OF FOUR TESTS VERIFIES THAT THE CSP, AND THE CSP ADDRESS FIELD "CSPADDR"
5191    !HAS NO STUCK ZERO BITS, AND THAT THE EMIT -> CSP -> D -> DBUF -> IR DATAPATH
5192    !IS FULLY FUNCTIONAL.
5193    !
5194    !       AFTER TEST 104B COMPLETES, THE CSP WILL LOOK AS FOLLOWS:
5195    !
5196    !       "BAS-CON"       "CSP-ADR"       CSP             INSTR5
5197    !       U<41:40>H       U<23:20>H       LOCT    -DATA-  TARGET
```

```
5198    !      ---------        ---------       ----    ------  ------
5199    !                         1111           00      000000  E78/434
5200    !                         1110           01      000152  E78/425
5201    !                         1101           02      000125  E78/432
5202    !                         1100           03      ------
5203    !                         1011           04      125200  E88/412
5204    !                         1010           05      ------
5205    !                         1001           06      ------
5206    !                         1000           07      152500  E88/405
5207    !                         0111           10      125200  E88/405
5208    !                         0110           11      ------
5209    !                         0101           12      ------
5210    !                         0100           13      125200  E88/412
5211    !            11           0011           14      ------
5212    !            10           0010           15      000125  E78/432
5213    !            01           0001           16      000152  E78/425
5214    !            00           0000           17      000000  E78/434
5215    !
5216
5217
5218    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5219
5220
5221    !TEST 102A VERIFIES THAT CSPD(02) WAS WRITTEN WITH THE UNIQUE INSTR5 PATTERN:
5222    !  (000125), E78 TARGET (432).  LOOKING FOR CSP ADDRESS BIT<01> STUCK ONE/ZERO,
5223    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
5224    5521:
5225    TEST102A:
5226            P0,     LOAD-ENUA(ZTARGET432),                  !INSTR5 E78 OUTPUT
5227                    LOAD-ERROR(TEST102A),                   !ERROR DIRECTORY KEY
5228                    DCS-CTR(C12.),                          !COMPARE AT TARGET
5229            NEXT,   J/LOAD01-102A                           !
    (5521)  DCS[1.00.1.0.0.0]  BM[0011..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.000]
5230
5231    5530:
5232    LOAD01-102A:
5233            P3,     CSPD[01]←EMIT, EMIT/000152,             !INSTR5 DATA PATTERN:
5234            NEXT,   J/LOAD02-102A                           !  (000152)=E78(425)
    (5530)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.01..101..010...0.0.0..0..0...0.1110...1..0000.0...11.000...001.101.001]
5235
5236    5151:  !(FREE)
5237    LOAD02-102A:
5238            P3,     CSPD[02]←EMIT, EMIT/000125,             !INSTR5 DATA PATTERN:
5239            NEXT,   J/LOAD04-102A                           !  (000125)=E78(432)
    (5151)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.01..010..101...0.0.0..0..0...0.1101...1..0000.0...11.000...001.101.010]
5240
5241    5152:  !(FREE)
5242    LOAD04-102A:
5243            P3,     CSPD[04]←EMIT, EMIT/125200,             !INSTR5 DATA PATTERN:
5244            NEXT,   J/LOAD10-102A                           !  (125200)=E88(412)
    (5152)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..000..000...0.0.0..0..0...0.1011...1..0000.0...11.000...001.101.011]
5245
5246    5153:  !(FREE)
5247    LOAD10-102A:
```

```
5248            P3,     CSPD[10]←EMIT, EMIT/152500,             !INSTR5 DATA PATTERN:
5249            NEXT,   J/LOADD0-102A                           !  (152500)=E88(405)
    (5153)  DCS[0.00.0.0.0.0]  BM[1101..10.01..01.01..000..000...0.0.0..0..0...0.0111...1..0000.0...11.000...001.101.100]
5250
5251    5154:  !(FREE)
5252    LOADD0-102A:
5253            P3,     CSPD[00]←EMIT, EMIT/000000,             !INSTR5 DATA PATTERN:
5254                                                            !  (000000)=E78(434)
5255            NEXT,   J/LOADD102A                             !IF THIS DATA USED, CSP ADDRESSING ERROR
    (5154)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1111...1..0000.0...11.000...001.101.101]
5256
5257    5155:  !(FREE)
5258    LOADD102A:
5259            P2-T,   D←CSPD(D02), BSEL/B17,                  !GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
5260            NEXT,   J/GOTEST102A                            !
    (5155)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.1101...0..0000.0...11.000...001.101.110]
5261
5262    5156:  !(FREE)
5263    GOTEST102A:
5264            SETUP,  RETURN/TEST102B,                        !GO TO SUBR WHICH:
5265            NEXT,   CALL[DINTOIR-5]                         ! D -> DBUF -> IR, THEN BUT(INSTR5)
    (5156)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
5266
5267
5268
5269
5270
5271    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5272
5273    !TEST 102B VERIFIES THAT CSPD(10) WAS WRITTEN WITH THE UNIQUE INSTR5 PATTERN:
5274    !  (152500), E88 TARGET (405).  LOOKING FOR CSP ADDRESS BIT<03> STUCK ONE/ZERO,
5275    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
5276    5574:
5277    TEST102B:
5278            P0,     LOAD-ENUA(ZTARGET405),                  !INSTR5 E88 OUTPUT
5279                    LOAD-ERROR(TEST102B),                   !ERROR DIRECTORY KEY
5280                    DCS-CTR(C7.),                           !COMPARE AT TARGET
5281            NEXT,   J/LOADD102B                             !
    (5574)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.111]
5282
5283    5157:  !(FREE)
5284    LOADD102B:
5285            P2-T,   D←CSPD(D10), BSEL/B17,                  !GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
5286            NEXT,   J/GOTEST102B                            !
    (5157)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0111...0..0000.0...11.000...001.110.000]
5287
5288    5160:  !(FREE)
5289    GOTEST102B:
5290            SETUP,  RETURN/TEST102C,                        !GO TO SUBR WHICH:
5291            NEXT,   CALL[DINTOIR-5]                         ! D -> DBUF -> IR, THEN BUT(INSTR5)
    (5160)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
5292
```

```
5293
5294
5295
5296
5297    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5298
5299    !TEST 102C VERIFIES THAT CSPD(04) WAS WRITTEN WITH THE UNIQUE INSTR5 PATTERN:
5300    !  (125200), E88 TARGET (412).  LOOKING FOR CSP ADDRESS BIT<02> STUCK ONE/ZERO,
5301    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
5302    5564:
5303    TEST102C:
5304            PD,     LOAD-ENUA(ZTARGET412),                  !INSTR5 E88 OUTPUT
5305                    LOAD-ERROR(TEST102C),                   !ERROR DIRECTORY KEY
5306                    DCS-CTR(C7.),                           !COMPARE AT TARGET
5307                    BUMP-VERIFY,                            !COUNT
5308            NEXT,   J/LOADD102C                             !
    (5564)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.001]
5309
5310    5161:  !(FREE)
5311    LOADD102C:
5312            P2-T,   D←CSPD(D04), BSEL/B17,                  !GET CSP LOC VIA CSPADDR, BASCON FIELD "DD"
5313            NEXT,   J/GOTEST102C                            !
    (5161)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.1011...0..0000.0...11.000...001.110.010]
5314
5315    5162:  !(FREE)
5316    GOTEST102C:
5317            SETUP,  RETURN/TEST102D,                        !GO TO SUBR WHICH:
5318            NEXT,   CALL[DINTOIR-5]                         ! D -> DBUF -> IR, THEN BUT(INSTR5)
    (5162)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
5319
5320
5321
5322
5323
5324    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5325
5326    !TEST 102D VERIFIES THAT CSPD(01) WAS WRITTEN WITH THE UNIQUE INSTR5 PATTERN:
5327    !  (000152), E78 TARGET (425).  LOOKING FOR CSP ADDRESS BIT<00> STUCK ONE/ZERO,
5328    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
5329    5554:
5330    TEST102D:
5331            PD,     LOAD-ENUA(ZTARGET425),                  !INSTR5 E88 OUTPUT
5332                    LOAD-ERROR(TEST102D),                   !ERROR DIRECTORY KEY
5333                    DCS-CTR(C7.),                           !COMPARE AT TARGET
5334            NEXT,   J/LOADD102D                             !
    (5554)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.011]
5335
5336    5163:  !(FREE)
5337    LOADD102D:
5338            P2-T,   D←CSPD(D01), BSEL/B17,                  !GET CSP LOC VIA CSPADDR, BASCON FIELD "DD"
5339            NEXT,   J/GOTEST102D                            !
    (5163)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.1110...0..0000.0...11.000...001.110.100]
5340
```

```
5341    5164:  !(FREE)
5342    GOTEST102D:
5343            SETUP,  RETURN/SCOPE102,                        !GO TO SUBR WHICH:
5344            NEXT,   CALL[DINTOIR-5]                         ! D -> DBUF -> IR, THEN BUT(INSTR5)
     (5164)  DCS[0.00.0.0.0.0]  BM[0101..00.00..11.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
5345
5346
5347
5348
5349    5165:  !(FREE)
5350    SCOPE102:
5351            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST103A" (+1. WORDS)
5352                    J/TEST103A                              !   ERROR:  "LOAD01-102A"  (-16. WORDS)
     (5165)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.001]
5353
5354
5355    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5356
5357
5358    !THE FOLLOWING SET OF FOUR TESTS VERIFIES THAT THE CSP, AND THE CSP ADDRESS FIELD "CSPADDR"
5359    !HAS NO STUCK ONE BITS, AND THAT THE EMIT -> CSP -> D -> DBUF -> IR DATAPATH
5360    !IS FULLY FUNCTIONAL.
5361
5362
5363    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5364
5365
5366    !TEST 103A VERIFIES THAT CSPD(13) WAS WRITTEN WITH THE UNIQUE INSTR5 PATTERN:
5367    !  (125200), E88 TARGET (412).  LOOKING FOR CSP ADDRESS BIT<02> STUCK ONE/ZERO,
5368    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
5369    5531:
5370    TEST103A:
5371            PO,     LOAD-ENUA(ZTARGET412),                  !INSTR5 E88 OUTPUT
5372                    LOAD-ERROR(TEST103A),                   !ERROR DIRECTORY KEY
5373                    DCS-CTR(C12.),                          !COMPARE AT TARGET
5374            NEXT,   J/LOAD16-103A                           !
     (5531)  DCS[1.00.1.0.0.0]  BM[0011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.110]
5375
5376    5546:
5377    LOAD16-103A:
5378            PO,     BUMP-VERIFY,                            !COUNT
5379            P3,     CSPD[16]←EMIT, EMIT/000152,             !INSTR5 DATA PATTERN:
5380            NEXT,   J/LOAD15-103A                           !  (000152)=E78(425)
     (5546)  DCS[0.00.0.0.0.1]  BM[0000..10.00..00.01..101..010...0.0.0..0..0...0.0001...1..0000.0...11.000...001.110.110]
5381
5382    5166:  !(FREE)
5383    LOAD15-103A:
5384            P3,     CSPD[15]←EMIT, EMIT/000125,             !INSTR5 DATA PATTERN:
5385            NEXT,   J/LOAD13-103A                           !  (000125)=E78(432)
     (5166)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.01..010..101...0.0.0..0..0...0.0010...1..0000.0...11.000...001.110.111]
5386
5387    5167:  !(FREE)
5388    LOAD13-103A:
```

```
5389            P3,     CSPD[13]←EMIT, EMIT/125200,             !INSTR5 DATA PATTERN:
5390            NEXT,   J/LOAD07-103A                           !  (125200)=E88(412)
    (5167)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..000..000...0.0.0..0..0...0.0100...1..0000.0...11.000...001.111.000]
5391
5392    5170:  !(FREE)
5393    LOAD07-103A:
5394            P3,     CSPD[07]←EMIT, EMIT/152500,             !INSTR5 DATA PATTERN:
5395            NEXT,   J/LOAD17-103A                           !  (152500)=E88(405)
    (5170)  DCS[0.00.0.0.0.0]  BM[1101..10.01..01.01..000..000...0.0.0..0..0...0.1000...1..0000.0...11.000...001.111.001]
5396
5397    5171:  !(FREE)
5398    LOAD17-103A:
5399            P3,     CSPD[17]←EMIT, EMIT/000000,             !INSTR5 DATA PATTERN:
5400                                                            !  (000000)=E78(434)
5401            NEXT,   J/LOADD103A                             !IF THIS DATA USED, CSP ADDRESSING ERROR
    (5171)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.111.010]
5402
5403    5172:  !(FREE)
5404    LOADD103A:
5405            P2-T,   D←CSPD(D13), BSEL/B17,                  !GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
5406            NEXT,   J/GOTEST103A                            !
    (5172)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0100...0..0000.0...11.000...001.111.011]
5407
5408    5173:  !(FREE)
5409    GOTEST103A:
5410            SETUP,  RETURN/TEST103B,                        !GO TO SUBR WHICH:
5411            NEXT,   CALL[DINTOIR-5]                         ! D -> DBUF -> IR, THEN BUT(INSTR5)
    (5173)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
5412
5413
5414
5415
5416
5417    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5418
5419    !TEST 103B VERIFIES THAT CSPD(15) WAS WRITTEN WITH THE UNIQUE INSTR5 PATTERN:
5420    !  (000125), E78 TARGET (432).  LOOKING FOR CSP ADDRESS BIT<01> STUCK ONE/ZERO,
5421    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
5422    5572:
5423    TEST103B:
5424            P0,     LOAD-ENUA(ZTARGET432),                  !INSTR5 E78 OUTPUT
5425                    LOAD-ERROR(TEST103B),                   !ERROR DIRECTORY KEY
5426                    DCS-CTR(C7.),                           !COMPARE AT TARGET
5427            NEXT,   J/LOADD103B                             !
    (5572)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.100]
5428
5429    5174:  !(FREE)
5430    LOADD103B:
5431            P2-T,   D←CSPD(D15), BSEL/B17,                  !GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
5432            NEXT,   J/GOTEST103B                            !
    (5174)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0010...0..0000.0...11.000...001.111.101]
5433
5434    5175:  !(FREE)
```

```
5435    GOTEST103B:
5436            SETUP,  RETURN/TEST103C,                        !GO TO SUBR WHICH:
5437            NEXT,   CALL[DINTOIR-5]                         ! D -> DBUF -> IR, THEN BUT(INSTR5)
    (5175)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
5438
5439
5440
5441
5442
5443    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5444
5445    !TEST 103C VERIFIES THAT CSPD(16) WAS WRITTEN WITH THE UNIQUE INSTR5 PATTERN:
5446    !  (000152), E78 TARGET (425).  LOOKING FOR CSP ADDRESS BIT<00> STUCK ONE/ZERO,
5447    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
5448    5576:
5449    TEST103C:
5450            P0,     LOAD-ENUA(ZTARGET425),                  !INSTR5 E78 OUTPUT
5451                    LOAD-ERROR(TEST103C),                   !ERROR DIRECTORY KEY
5452                    DCS-CTR(C7.),                           !COMPARE AT TARGET
5453                    BUMP-VERIFY,                            !COUNT
5454            NEXT,   J/LOADD103C                             !
    (5576)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.110]
5455
5456    5176:  !(FREE)
5457    LOADD103C:
5458            P2-T,   D←CSPD(D16), BSEL/B17,                  !GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
5459            NEXT,   J/GOTEST103C                            !
    (5176)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0001...0..0000.0...11.000...001.111.111]
5460
5461    5177:  !(FREE)
5462    GOTEST103C:
5463            SETUP,  RETURN/TEST103D,                        !GO TO SUBR WHICH:
5464            NEXT,   CALL[DINTOIR-5]                         ! D -> DBUF -> IR, THEN BUT(INSTR5)
    (5177)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
5465
5466
5467
5468
5469
5470    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5471
5472    !TEST 103D VERIFIES THAT CSPD(07) WAS WRITTEN WITH THE UNIQUE INSTR5 PATTERN:
5473    !  (152500), E88 TARGET (405).  LOOKING FOR CSP ADDRESS BIT<03> STUCK ONE/ZERO,
5474    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
5475    5674:
5476    TEST103D:
5477            P0,     LOAD-ENUA(ZTARGET405),                  !INSTR5 E88 OUTPUT
5478                    LOAD-ERROR(TEST103D),                   !ERROR DIRECTORY KEY
5479                    DCS-CTR(C7.),                           !COMPARE AT TARGET
5480            NEXT,   J/LOADD103D                             !
    (5674)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.000]
5481
```

```
5482    5200:  !(FREE)
5483    LOADD103D:
5484            P2-T,   D←CSPD(D07), BSEL/B17,                  !GET CSP LOC VIA CSPADDR, BASCON FIELD "00"
5485            NEXT,   J/GOTEST103D                            !
    (5200)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.1000...0..0000.0...11.000...010.000.001]
5486
5487    5201:  !(FREE)
5488    GOTEST103D:
5489            SETUP,  RETURN/SCOPE103,                        !GO TO SUBR WHICH:
5490            NEXT,   CALL[DINTOIR-5]                         ! D -> DBUF -> IR, THEN BUT(INSTR5)
    (5201)  DCS[0.00.0.0.0.0]  BM[0101..00.01..00.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
5491
5492
5493
5494
5495    5202:  !(FREE)
5496    SCOPE103:
5497            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST104A" (+1. WORDS)
5498                    J/TEST104A                              !   ERROR:  "LOAD16-103A"  (-16. WORDS)
    (5202)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.111]
5499
5500
5501    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5502
5503    !THE FOLLOWING SET OF TWO TESTS VERIFIES THAT THE CSP, AND THE CSP ADDRESS FIELD "BASCON"
5504    !HAS NO STUCK ZERO/ONE BITS, AND THAT THE EMIT -> CSP -> D -> DBUF -> IR DATAPATH
5505    !IS FULLY FUNCTIONAL.
5506
5507
5508    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5509
5510
5511    !TEST 104A VERIFIES THAT CSPB(16) WAS WRITTEN WITH THE UNIQUE INSTR5 PATTERN:
5512    !  (000152), E78 TARGET (425).  LOOKING FOR CSP ADDRESS BIT<00> STUCK ONE/ZERO,
5513    !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
5514    !THIS TEST USES THE "BASCON" ADDRESS MODE FOR THE CSP.
5515    5547:
5516    TEST104A:
5517            P0,     LOAD-ENUA(ZTARGET425),                  !INSTR5 E78 OUTPUT
5518                    LOAD-ERROR(TEST104A),                   !ERROR DIRECTORY KEY
5519                    DCS-CTR(07.),                           !COMPARE AT TARGET
5520            NEXT,   J/LOADD104A                             !
    (5547)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.000]
5521
5522    5540:
5523    LOADD104A:
5524            P2-T,   D←CSPB(B16), CSPADDR/D17,               !GET CSP LOC VIA BASCON, CSPADDR FIELD "0000"
5525            NEXT,   J/GOTEST104A                            !
    (5540)  DCS[0.00.0.0.0.0]  BM[1010..11.01..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...010.000.011]
5526
5527    5203:  !(FREE)
5528    GOTEST104A:
5529            SETUP,  RETURN/TEST104B,                        !GO TO SUBR WHICH:
```

```
5530                    NEXT,   CALL[DINTOIR-5]                         ! D -> DBUF -> IR, THEN BUT(INSTR5)
     (5203)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
5531
5532
5533
5534
5535
5536          ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5537
5538          !TEST 1048 VERIFIES THAT CSPB(15) WAS WRITTEN WITH THE UNIQUE INSTR5 PATTERN:
5539          !  (000125), E78 TARGET (432).  LOOKING FOR CSP ADDRESS BIT<01> STUCK ONE/ZERO,
5540          !  OR ERRORS IN DATAPATH FROM EMIT -> CSP -> ALU-B -> D -> DBUF -> IR.
5541          !THIS TEST USES THE "BASCON" ADDRESS MODE FOR THE CSP.
5542          5646:
5543          TEST1048:
5544                  PO,     LOAD-EMUA(ZTARGET432),                  !INSTR5 E78 OUTPUT
5545                          LOAD-ERROR(TEST1048),                   !ERROR DIRECTORY KEY
5546                          DCS-CTR(C7.),                           !COMPARE AT TARGET
5547                  NEXT,   J/LOADD1048                             !
     (5646)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.100]
5548
5549          5204:  !(FREE)
5550          LOADD1048:
5551                  P2-T,   D+CSPB(B15), CSPADDR/D17,               !GET CSP LOC VIA BASCON, CSPADDR FIELD "0000"
5552                  NEXT,   J/GOTEST1048                            !
     (5204)  DCS[0.00.0.0.0.0]  BM[1010..11.10..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...010.000.101]
5553
5554          5205:  !(FREE)
5555          GOTEST1046:
5556                  SETUP,  RETURN/SCOPE104,                        !GO TO SUBR WHICH:
5557                  NEXT,   CALL[DINTOIR-5]                         ! D -> DBUF -> IR, THEN BUT(INSTR5)
     (5205)  DCS[0.00.0.0.0.0]  BM[0101..00.01..00.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
5558
5559
5560
5561
5562          5206:  !(FREE)
5563          SCOPE104:
5564                  PO,     BUSDIN+EMIT-[I],                        !RESET PROC UCON
5565                          EN-CLK-IR[15-00],                       !
5566                  NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST105A" (+1. WORDS)
5567                          J/TEST105A                              !   ERROR:  "LOADD104A"  (-5. WORDS)
     (5206)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.100.001]
5568
5569
5570
5571          !.PAGE=============================================================================================================
5572
5573          .TOC    *    TEST105:  SR CAN LOAD/STORE AS A REGISTER
5574
5575          !*****************************************************************************************************
5576          !*
```

```
5577    !*      TESTS:  105                                     UWORDS:  023 + 032
5578    !*
5579    !*      FUNCTIONS:
5580    !*
5581    !*      THE FOLLOWING TESTS VERIFY THE VALIDITY OF THE SR AS A TEMPORARY REGISTER,
5582    !*      (IE, IT CAN BE LOADED/READ) IN ALL BIT POSITIONS, AND THAT THE ALU-A SIDE CAN
5583    !*      PASS DATA INTO D.
5584    !*
5585    !*****************************************************************************************
5586
5587
5588    !TEST 105A VERIFIES THAT THE SR CAN BE LOADED/READ WITH THE INSTR5 PATTERN:
5589    !  (000125), E78 TARGET (432), AND TO VERIFY THE:
5590    !  DATAPATH FROM SR -> ALU-A -> D -> DBUF -> IR.
5591    5541:
5592    TEST105A:
5593            P0,     LOAD-ENUA(ZTARGET432),                  !INSTR5 E78 OUTPUT
5594                    LOAD-ERROR(TEST105A),                   !ERROR DIRECTORY KEY
5595                    DCS-CTR(C8.),                           !COMPARE AT TARGET
5596                    BUMP-VERIFY,                            !COUNT
5597            NEXT,   J/LOADSR105A                            !
    (5541)  DCS[1.00.1.0.0.1]  BM[0111..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.010]
5598
5599    5542:
5600    LOADSR105A:
5601            P2,     RES←CSPD(D02),                          !BITS<13:11>=00/0, WHICH IS:  SR/LOAD, GUARD/DISABLED
5602            P3-T,   SR←CSPD(D02), BSEL/B17,                 !DATA IS (000125) = INSTR5 E78 (432)
5603            NEXT,   J/GOTEST105A                            !
    (5542)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...1.0.1..0..0...0.1101...0..1000.1...11.000...010.000.111]
5604
5605    5207:  !(FREE)
5606    GOTEST105A:
5607            P0,     BUMP-VERIFY,                            !COUNT
5608            SETUP,  RETURN/TEST105A1,                       !GO TO SUBR WHICH:
5609            NEXT,   CALL[SRINTOIR-5]                        ! SR -> D -> DBUF -> IR, THEN BUT(INSTR5)
    (5207)  DCS[0.00.0.0.0.1]  BM[0101..00.11..00.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.010]
5610
5611
5612
5613
5614
5615    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
5616
5617    !TEST 105A1 VERIFIES THAT THE BUT(SR3-0) SEES THE "0101" IN THE SR.
5618    5610:
5619    TEST105A1:
5620            P0,     LOAD-ENUA(ZTARGET405),                  !BIT<3:0> = "0101"
5621                    LOAD-ERROR(TEST105A1),                  !ERROR DIRECTORY KEY
5622                    DCS-CTR(C3.),                           !COMPARE AT TARGET
5623            NEXT,   J/GOBUT105A1                            !
    (5610)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.000]
5624
5625    5210:  !(FREE)
```

```
5626    GOBUT105A1:
5627            PO,     BUMP-VERIFY,                            !COUNT
5628            SETUP,  RETURN/TEST105B,                        !RETURN TO START OF NEXT SUBTEST
5629            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
5630                    J/BUTSR3-0                              !SR<3:0> IN BIT<3:0>
     (5210)  DCS[0.00.0.0.0.1]  BM[0101..00.11..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.110]
5631
5632
5633
5634
5635
5636    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5637
5638    !TEST 105B VERIFIES THAT THE SR CAN BE LOADED/READ WITH THE INSTR5 PATTERN:
5639    !  (000152), E78 TARGET (425), AND TO VERIFY THE:
5640    !  DATAPATH FROM SR -> ALU-A -> D -> DBUF -> IR.
5641    5652:
5642    TEST105B:
5643            PO,     LOAD-EMUA(ZTARGET425),                  !INSTR5 E78 OUTPUT
5644                    LOAD-ERROR(TEST105B),                   !ERROR DIRECTORY KEY
5645                    DCS-CTR(C8.),                           !COMPARE AT TARGET
5646            NEXT,   J/LOADSR105B                            !
     (5652)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.001]
5647
5648    5211:  !(FREE)
5649    LOADSR105B:
5650            P2-T,   SR←CSPD(D01), BSEL/B17,                 !DATA IS (000152) = INSTR5 E78 (425)
5651            NEXT,   J/GOTEST105B                            !
     (5211)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1110...0..0000.0...11.000...010.001.010]
5652
5653    5212:  !(FREE)
5654    GOTEST105B:
5655            SETUP,  RETURN/TEST105B1,                       !GO TO SUBR WHICH:
5656            NEXT,   CALL[SRINTOIR-5]                        ! SR -> D -> DBUF -> IR, THEN BUT(INSTR5)
     (5212)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.010]
5657
5658
5659
5660
5661
5662    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5663
5664    !TEST 105B1 VERIFIES THAT THE BUT(SR3-0) SEES THE "1010" IN THE SR.
5665    5600:
5666    TEST105B1:
5667            PO,     LOAD-EMUA(ZTARGET412),                  !BIT<3:0> = "1010"
5668                    LOAD-ERROR(TEST105B1),                  !ERROR DIRECTORY KEY
5669                    DCS-CTR(C3.),                           !COMPARE AT TARGET
5670                    BUMP-VERIFY,                            !COUNT
5671            NEXT,   J/GOBUT105B1                            !
     (5600)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.011]
5672
```

```
5673    5213:  !(FREE)
5674    GOBUT105B1:
5675            SETUP,  RETURN/TEST105C,                        !RETURN TO START OF NEXT SUBTEST
5676            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
5677                    J/BUTSR3-0                              !SR<3:0> IN BIT<3:0>
    (5213)  DCS[0.00.0.0.0.0]  BM[0101..00.11..01.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.110]
5678
5679
5680
5681
5682
5683
5684    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5685
5686    !TEST 105C VERIFIES THAT THE SR CAN BE LOADED/READ WITH THE INSTR5 PATTERN:
5687    !  (125200), E88 TARGET (412), AND TO VERIFY THE:
5688    !  DATAPATH FROM SR -> ALU-A -> D -> DBUF -> IR.
5689    5642:
5690    TEST105C:
5691            P0,     LOAD-ENUA(ZTARGET412),                  !INSTR5 E88 OUTPUT
5692                    LOAD-ERROR(TEST105C),                   !ERROR DIRECTORY KEY
5693                    DCS-CTR(C8.),                           !COMPARE AT TARGET
5694            NEXT,   J/LOADSR105C                            !
    (5642)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.100]
5695
5696    5214:  !(FREE)
5697    LOADSR105C:
5698            P2-T,   SR←CSPD(D04), BSEL/B17,                 !DATA IS (125200) = INSTR5 E88 (412)
5699            NEXT,   J/GOTEST105C                            !
    (5214)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1011...0..0000.0...11.000...010.001.101]
5700
5701    5215:  !(FREE)
5702    GOTEST105C:
5703            SETUP,  RETURN/TEST105D,                        !GO TO SUBR WHICH:
5704            NEXT,   CALL[SRINTOIR-5]                        ! SR -> D -> DBUF -> IR, THEN BUT(INSTR5)
    (5215)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.010]
5705
5706
5707
5708
5709
5710    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5711
5712    !TEST 105D VERIFIES THAT THE SR CAN BE LOADED/READ WITH THE INSTR5 PATTERN:
5713    !  (152500), E88 TARGET (405), AND TO VERIFY THE:
5714    !  DATAPATH FROM SR -> ALU-A -> D -> DBUF -> IR.
5715    5636:
5716    TEST105D:
5717            P0,     LOAD-ENUA(ZTARGET405),                  !INSTR5 E88 OUTPUT
5718                    LOAD-ERROR(TEST105D),                   !ERROR DIRECTORY KEY
5719                    DCS-CTR(C8.),                           !COMPARE AT TARGET
5720            NEXT,   J/LOADSR105D                            !
```

```
      (5636)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.110]
5721
5722     5216:  !(FREE)
5723     LOADSR105D:
5724             PO,     BUMP-VERIFY,                              !COUNT
5725             P2-T,   SR←CSPD(D10), BSEL/B17,                   !DATA IS (152500) = INSTR5 E88 (405)
5726             NEXT,   J/GOTEST105D                              !
      (5216)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0111...0..0000.0...11.000...010.001.111]
5727
5728     5217:  !(FREE)
5729     GOTEST105D:
5730             SETUP,  RETURN/TEST105E,                          !GO TO SUBR WHICH:
5731             NEXT,   CALL[SRINTOIR-5]                          ! SR -> D -> DBUF -> IR, THEN BUT(INSTR5)
      (5217)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.010]
5732
5733
5734
5735
5736
5737     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
5738
5739     !TEST 105E VERIFIES THE DATAPATH FROM:
5740     !  EMIT -> CSP -> ALU-B -> SR -> ALU-A -> D -> DBUF -> IR,
5741     !  IS A VALID "1101" IN BITS<15:12>.  SR VALUE = (152500) FROM PREVIOUS TEST.
5742     5620:
5743     TEST105E:
5744             PO,     LOAD-ENUA(ZTARGET415),                    !BIT<15:12> = "1101"
5745                     LOAD-ERROR(TEST105E),                     !ERROR DIRECTORY KEY
5746                     DCS-CTR(C3.),                             !COMPARE AT TARGET
5747             NEXT,   J/GOTEST105E                              !
      (5620)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.010.000]
5748
5749     5220:  !(FREE)
5750     GOTEST105E:
5751             SETUP,  RETURN/SCOPE105,                          !RETURN TO SCOPE LOOP TEST WORD
5752             NEXT,   GOTO-PAGE(7),                             !BUT TABLE
5753                     J/BUTIR15-12                              !BIT<15:12> TEST
      (5220)  DCS[0.00.0.0.0.0]  BM[0101..00.01..00.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.000]
5754
5755
5756
5757     5221:  !(FREE)
5758     SCOPE105:
5759             PO,     BUSDIN←EMIT-[I],                          !RESET PROC UCON
5760                     EN-CLK-IR[15-00],                         !
5761             NEXT,   BUTD[SCOPE],                              !NO ERROR:  "SETUPCSP17A" (+1. WORDS)
5762                     J/SETUPCSP17A                             !   ERROR:  "LOADSR105A"  (-17. WORDS)
      (5221)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.100.011]
5763
5764
5765
5766
```

```
5767
5768
5769
5770    !.PAGE=========================================================================================================
5771
5772    .TOC   *   TEST114-121:  ALU LOGIC TESTS / D[C] TESTS
5773
5774    !*************************************************************************************************
5775    !*
5776    !*     TESTS:  114 - 121                                    UWORDS:  250 + 300
5777    !*
5778    !*     FUNCTIONS:
5779    !*
5780    !*     THESE TESTS TEST THE ALU LOGIC FUNCTIONS.
5781    !*
5782    !*************************************************************************************************
5783
5784
5785
5786    !
5787    !      SUMMARY OF ALU LOGIC / D[C] TESTS:
5788    !
5789    !      TEST          ALU           OPERANDS          D[C]
5790    !      NUMB          FUNCTION      A/B=D             FUNCTION
5791    !      ----          --------      --------          --------
5792    !
5793    !      114A          ZERO          1/1=0             CIN=PS[C]=0
5794    !
5795    !      115A          NOT-A         1/1=0             CIN=1
5796    !      115B          NOT-A         0/1=1             PS[C]=0
5797    !      115C          NOT-A         0/0=1
5798    !      115D          NOT-A         1/0=0
5799    !
5800    !      116A          NOT-A-AND-B   0/1=1             ALU15=1, D[C]=1
5801    !      116B          ZERO          1/0=0
5802    !      116C          NOT-A-AND-B   0/0=0             ALU15=0, D[C]=0
5803    !      116D          ZERO          0/1=0
5804    !
5805    !      117A          A-AND-NOT-B   1/0=1             CIN=D[C]=0
5806    !      117B          A-AND-NOT-B   1/1=0             (ALU15=1)
5807    !      117C          A-AND-NOT-B   0/0=0             CIN=D[C]=1
5808    !
5809    !      120A          A-AND-B       0/1=0
5810    !      120B          A-AND-B       1/1=1             CIN=0
5811    !
5812    !      121A          A-XOR-B       0/0=0             ALU00=1
5813    !      121B          A-XOR-B       1/0=1             ALU00=0
5814    !      121C          A-XOR-B       0/1=1             ALU07=1
5815    !      121D          A-XOR-B       1/1=0             ALU07=0
5816    !
5817    !      122A          A-IOR-B       0/0=0             CIN=1
5818    !      122A3         BUT(D<14-00>=ZERO*D15) W/ D=(000000)
5819    !      122A4         BUT(D<14-00>=ZERO*D15) W/ D=(125252)
5820    !
```

```
5821    !
5822
5823    !FOR THE ALU LOGIC TESTS FOLLOWING, THE REQUIRED CONSTANTS
5824    !IN THE CSP ARE:
5825    5543:
5826    SETUPCSP17A:
5827            P3,     CSPD[15]←EMIT, EMIT/000077,             !MASK FOR BITS<05:00>
5828            NEXT,   GOTO-PAGE(7),                           !XFR
5829                    J/SETUPCSP16A                           !
    (5543)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..111..111...0.0.0..0..0...0.0010...1..0000.0...11.100...000.000.010]
5830
5831    7002:  !(FREE)
5832    SETUPCSP16A:
5833            P3,     CSPD[16]←EMIT, EMIT/170000,             !BITS<15:12> SET
5834            NEXT,   J/SETUPCSP15A                           !
    (7002)  DCS[0.00.0.0.0.0]  BM[1111..10.00..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.001.000]
5835
5836    7010:  !(FREE)
5837    SETUPCSP15A:
5838            P3,     CSPD[17]←EMIT, EMIT/007700,             !MASK FOR BITS<11:06>
5839            NEXT,   J/SETUPCSP14A                           !
    (7010)  DCS[0.00.0.0.0.0]  BM[0000..10.11..11.11..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...000.001.001]
5840
5841    7011:  !(FREE)
5842    SETUPCSP14A:
5843            P3,     CSPD[14]←EMIT, EMIT/000100,             !BIT<06> SET
5844            NEXT,   J/SETUPCSP12A                           !
    (7011)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.01..000..000...0.0.0..0..0...0.0011...1..0000.0...11.000...000.001.010]
5845
5846    7012:  !(FREE)
5847    SETUPCSP12A:
5848            P3,     CSPD[11]←EMIT, EMIT/125252,             !PATTERN: "1010 1010 1010 1010"
5849            NEXT,   J/SETUPCSP05A                           !
    (7012)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..101..010...0.0.0..0..0...0.0110...1..0000.0...11.000...000.001.011]
5850
5851    7013:  !(FREE)
5852    SETUPCSP05A:
5853            P3,     CSPD[10]←EMIT, EMIT/052525,             !PATTERN: "0101 0101 0101 0101"
5854            NEXT,   J/SETUPCSP07A                           !
    (7013)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.0111...1..0000.0...11.000...000.001.100]
5855
5856    7014:  !(FREE)
5857    SETUPCSP07A:
5858            P3,     CSPD[12]←EMIT, EMIT/177777,             !PATTERN: "1111 1111 1111 1111 "
5859            NEXT,   J/SETUPCSP00A                           !
    (7014)  DCS[0.00.0.0.0.0]  BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.0101...1..0000.0...11.000...000.001.101]
5860
5861    7015:  !(FREE)
5862    SETUPCSP00A:
5863            P3,     CSPD[13]←EMIT, EMIT/000000,             !PATTERN: "0000 0000 0000 0000"
5864            NEXT,   GOTO-PAGE(0),                           !SAME AS (4)
5865                    J/TEST114A                              !
```

```
     (7015)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.0100...1..0000.0...11.100...110.000.111]
5866
5867
5868
5869
5870     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5871
5872     !VERIFY THAT WITH: ALU=(ZERO), A=(177777), B=(177777), THEN D=(000000), AND D[C]=CIN=PS[C]=(0)
5873     4607:
5874     TEST114A:
5875             P0,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
5876                     LOAD-ERROR(TEST114A),                  !ERROR DIRECTORY KEY
5877                     DCS-CTR(C8.),                          !COMPARE AT TARGET
5878             NEXT,   J/GETONES114A                          !
     (4607)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...110.000.000]
5879
5880     4600:
5881     GETONES114A:
5882             P2-T,   D←CSPD(C177777), D[C]←ALU15,           !ALL ONES STORED HERE
5883             P3,     A#BSPHI[C177777]←D,                    !WRITE INTO ASP,BSP
5884             NEXT,   J/ALU114A
     (4600)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..101..100...0.1.0..0..0...0.0101...0..1111.0...11.000...000.000.011]
5885
5886     4003:  !(FREE)
5887     ALU114A:
5888             P2-T,   D←ZERO, D[C]←CINMUX,                   !ALU=(ZERO), D[C]=CIN=PS[C]=(0)
5889                     BUS-A←ASPHI(C177777),                  !A=(177777)
5890                     BUS-B←CSPD(C177777),                   !B=(177777)
5891             NEXT,   J/GETZEROES114A                        !D=(000000)
     (4003)  DCS[0.00.0.0.0.0]  BM[0011..10.00..11.01..101..000...0.1.0..0..0...0.0101...0..0000.0...11.000...000.000.100]
5892
5893     4004:  !(FREE)
5894     GETZEROES114A:
5895             P3,     A#BSPHI[C000000]←D,                    !ALL ZEROS STORED HERE IN ASP, BSP
5896             NEXT,   J/GOBUT114A                            !
     (4004)  DCS[0.00.0.0.0.0]  BM[0000..00.11..00.01..100..000...0.0.0..0..0...0.0000...0..1111.0...11.000...000.000.101]
5897
5898     4005:  !(FREE)
5899     GOBUT114A:
5900             SETUP,  RETURN/TEST114A2,                      !EXEC SUBR WHICH:
5901                                                            !(1) D -> IR
5902             NEXT,   CALL[DZERO]                            !(2) BUT(INSTR5) INTO ZTARGET---
     (4005)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.010]
5903
5904     !CHECK THAT D[C] GOT A (0) FROM "CINMUX=PS[C]", ABOVE
5905     4603:
5906     TEST114A2:
5907             P0,     LOAD-ENUA(ZTARGET402),                  !BIT <00> = D[C] = (0)
5908                     LOAD-ERROR(TEST114A2),                 !ERROR DIRECTORY KEY
5909                     DCS-CTR(C3.),                          !COMPARE AT TARGET
5910             NEXT,   J/GOBUT114A2                           !
     (4603)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.110]
5911
```

```
5912    4006:  !(FREE)
5913    GOBUT114A2:
5914            SETUP,  RETURN/SCOPE114A,                       !RETURN TO SCOPE LOOP TEST WORD
5915            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
5916                    J/BUTD[C]A                              !D[C]H IN BIT<00>
    (4006)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
5917
5918
5919    4007:  !(FREE)
5920    SCOPE114A:
5921            P2-T,   D←CSPD(C052525), SAVE-D[C],             !STORE A CONSTANT
5922            P3,     A#BSPHI[C052525]←D,                     !
5923            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST1:5A1"  (+1. WORDS)
5924                    J/TEST1:5A1                             !   ERROR:  "GETONES114A" (-6.WORDS)
    (4007)  DCS[0.00.0.1.0.0]  BM[1010..10.11..00.01..111..111...0.1.0..0..0...0.0111...0..1111.0...11.000...110.000.001]
5925
5926
5927
5928
5929
5930    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5931
5932    !THIS NEXT SET OF 12. TESTS EXERCISES THE "NOT-A" ALU FUNCTION
5933
5934    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
5935
5936    !TESTS 115A 1-3 VERIFIES THAT WITH:
5937    !ALU=(NOT-A), A=(052525), B=(177777), THEN D=(125252), AND D[C]=CINMUX=(1)
5938    4601:
5939    TEST115A1:
5940            P0,     LOAD-ENUA(ZTARGET412),                  !BIT<15:12> = "1010"
5941                    LOAD-ERROR(TEST115A1),                  !ERROR DIRECTORY KEY
5942                    DCS-CTR(C7.),                           !COMPARE AT TARGET
5943            NEXT,   J/ALU115A1                              !
    (4601)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.001.000]
5944
5945    4610:
5946    ALU115A1:
5947            P0,     BUMP-VERIFY,                            !COUNT
5948            P2-T,   D←NOT-A, D[C]←CINMUX,                   !ALU=(NOT-A) D[C]=CINMUX=(1)
5949                    BUS-A←ASPHI(C052525),                   !A=(052525)
5950                    BUS-B←CSPD(C177777),                    !B=(177777)
5951            NEXT,   J/GETALTN115A1                          !D=(125252)
    (4610)  DCS[0.00.0.0.0.1]  BM[0000..10.00..11.01..111..000...0.1.0..0..0...0.0101...0..0000.0...11.000...000.001.000]
5952
5953    4010:  !(FREE)
5954    GETALTN115A1:
5955            P3,     A#BSPHI[C125252]←D,                     !STORE CONSTANT (125252), HOPEFULLY
5956            NEXT,   J/GOBUT115A1                            !
    (4010)  DCS[0.00.0.0.0.0]  BM[0000..00.11..00.01..110..000...0.0.0..0..0...0.0000...0..1111.0...11.000...000.001.001]
5957
5958    4011:  !(FREE)
5959    GOBUT115A1:
```

```
5960            SETUP,  RETURN/TEST115A4,                       !EXEC SUBR WHICH:
5961                                                            !(1) D<15:12> -> IR<15:12>
5962            NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
     (4011)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
5963
5964
5965    !CHECK THAT D[C] GOT A (1) FROM "CINMUX=(1)", ABOVE
5966    4604:
5967    TEST115A4:
5968            PO,     LOAD-ENUA(ZTARGET403),                  !BIT <00> = D[C] = (1)
5969                    LOAD-ERROR(TEST115A4),                  !ERROR DIRECTORY KEY
5970                    DCS-CTR(C3.),                           !COMPARE AT TARGET
5971                    BUMP-VERIFY,                            !COUNT
5972            NEXT,   J/GOBUT115A4                            !
     (4604)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.010]
5973
5974    4012:  !(FREE)
5975    GOBUT115A4:
5976            SETUP,  RETURN/TEST115A2,                       !RETURN TO START OF NEXT SUBTEST
5977            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
5978                    J/BUTD[C]A                              !D[C]H IN BIT<00>
     (4012)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
5979
5980
5981    !CHECK BIT<11:06> = "1010 10"
5982    4616:
5983    TEST115A2:
5984            PO,     LOAD-ENUA(ZTARGET412),                  !INSTR5-E78 OUTPUT FOR BIT <11:06>="101 010"
5985                    LOAD-ERROR(TEST115A2),                  !ERROR DIRECTORY KEY
5986                    DCS-CTR(C6.),                           !COMPARE AT TARGET
5987                    BUMP-VERIFY,                            !COUNT
5988            NEXT,   J/GOBUT115A2                            !
     (4616)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.011]
5989
5990    4013:  !(FREE)
5991    GOBUT115A2:
5992            SETUP,  RETURN/TEST115A3,                       !EXEC SUBR WHICH:
5993                                                            !(1) D<11:06> -> IR<11:06>
5994            NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
     (4013)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
5995
5996
5997
5998    !CHECK BIT<05:00> = "10 1010"
5999    4615:
6000    TEST115A3:
6001
6002            PO,     LOAD-ENUA(ZTARGET425),                  !INSTR5-E88 OUTPUT FOR BIT <05:00> = "101 010"
6003                    LOAD-ERROR(TEST115A3),                  !ERROR DIRECTORY KEY
6004                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6005            NEXT,   J/GOBUT115A3                            !
```

```
     (4615)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.100]
 6006
 6007    4014:  !(FREE)
 6008    GOBUT115A3:
 6009           SETUP,  RETURN/TEST115B1,                        !EXEC SUBR WHICH:
 6010                                                            !(1) D<05:00> -> IR<05:00>
 6011           NEXT,   CALL[D05-00]                             !(2) BUT(INSTR5) INTO ZTARGET---
     (4014)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
 6012
 6013
 6014
 6015
 6016    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
 6017
 6018    !TESTS 115B 1-3 VERIFIES THAT WITH:
 6019    !ALU=(NOT-A), A=(125252), B=(177777), THEN D=(052525), AND D[C]+PS[C]=(0)
 6020    4614:
 6021    TEST115B1:
 6022           PO,     LOAD-ENUA(ZTARGET405),                   !BIT <15:12> = "0101"
 6023                   LOAD-ERROR(TEST115B1),                   !ERROR DIRECTORY KEY
 6024                   DCS-CTR(C6.),                            !COMPARE AT TARGET
 6025           NEXT,   J/ALU115B1                               !
     (4614)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.101]
 6026
 6027    4015:  !(FREE)
 6028    ALU115B1:
 6029           PO,     BUMP-VERIFY,                             !COUNT
 6030           P2-T,   D+NOT-A, D[C]+PS[C],                     !ALU=(NOT-A), D[C]=PS[C]=(0)
 6031                   BUS-A+ASPHI(C125252),                    !A=(125252)
 6032                   BUS-B+CSPD(C177777),                     !B=(177777)
 6033           NEXT,   J/GOBUT115B1                             !D=(052525)
     (4015)  DCS[0.00.0.0.0.1]  BM[0000..10.00..11.01..110..001...0.1.0..0..0...0.0101...0..0000.0...11.000...000.001.110]
 6034
 6035    4016:  !(FREE)
 6036    GOBUT115B1:
 6037           SETUP,  RETURN/TEST115B4,                        !EXEC SUBR WHICH:
 6038                                                            !(1) D<15:12> -> IR<15:12>
 6039           NEXT,   CALL[D15-12]                             !(2) BUT(IR15-12) INTO ZTARGET---
     (4016)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
 6040
 6041
 6042    !CHECK THAT D[C] GOT A (0) FROM "PS[C]", ABOVE
 6043    4602:
 6044    TEST115B4:
 6045           PO,     LOAD-ENUA(ZTARGET402),                   !BIT <00> = D[C] = (0)
 6046                   LOAD-ERROR(TEST115B4),                   !ERROR DIRECTORY KEY
 6047                   DCS-CTR(C3.),                            !COMPARE AT TARGET
 6048                   BUMP-VERIFY,                             !COUNT
 6049           NEXT,   J/GOBUT115B4                             !
     (4602)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.111]
 6050
 6051    4017:  !(FREE)
```

```
6052    GOBUT11584:
6053            SETUP,  RETURN/TEST11582,                       !RETURN TO START OF NEXT SUBTEST
6054            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
6055                    J/BUTD[C]0                              !D[C]H IN BIT<00>
    (4017)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
6056
6057
6058    !CHECK BIT<11:06> = "0101 01"
6059    4613:
6060    TEST11582:
6061            PO,     LOAD-ENUA(ZTARGET405),                  !INSTR5-E78 OUTPUT FOR BIT <11:06> = "010 101"
6062                    LOAD-ERROR(TEST11582),                  !ERROR DIRECTORY KEY
6063                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6064                    BUMP-VERIFY,                            !COUNT
6065            NEXT,   J/GOBUT11582                            !
    (4613)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.000]
6066
6067    4020:  !(FREE)
6068    GOBUT11582:
6069            SETUP,  RETURN/TEST11583,                       !EXEC SUBR WHICH:
6070                                                            !(1) D<11:06> -> IR<11:06>
6071            NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
    (4020)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
6072
6073
6074
6075    !CHECK BIT<05:00> = "01 0101"
6076    4612:
6077    TEST11583:
6078
6079            PO,     LOAD-ENUA(ZTARGET432),                  !INSTR5-E88 OUTPUT FOR BIT<05:00> = "010 101"
6080                    LOAD-ERROR(TEST11583),                  !ERROR DIRECTORY KEY
6081                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6082            NEXT,   J/GOBUT11583                            !
    (4612)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.001]
6083
6084    4021:  !(FREE)
6085    GOBUT11583:
6086            SETUP,  RETURN/SCOPE115B,                       !EXEC SUBR WHICH:
6087                                                            !(1) D<05:00> -> IR<05:00>
6088            NEXT,   CALL[D05-00]                            !(2) BUT(INSTR5) INTO ZTARGET---
    (4021)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
6089
6090
6091    4022:  !(FREE)
6092    SCOPE115B:
6093            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST115C1"   (+1. WORDS)
6094                    J/TEST115C1                             !   ERROR:  "ALU115A1" (-17.WORDS)
    (4022)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.001.001]
6095
6096
```

```
6097
6098
6099    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6100
6101    !TESTS 115C 1-3 VERIFIES THAT WITH:
6102    !ALU=(NOT-A), A=(052525), B=(000000), THEN D=(125252)
6103    4611:
6104    TEST115C1:
6105            PD,     LOAD-ENUA(ZTARGET412),                  !BIT <15:12> = "1010"
6106                    LOAD-ERROR(TEST115C1),                  !ERROR DIRECTORY KEY
6107                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6108            NEXT,   J/ALU115C1                              !
    (4611)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.010]
6109
6110    4622:
6111    ALU115C1:
6112            PD,     BUMP-VERIFY,                            !COUNT
6113            P2-T,   D+NOT-A, SAVE-D[C],                     !ALU=(NOT-A)
6114                    BUS-A+ASPHI(C052525),                   !A=(052525)
6115                    BUS-B+CSPD(C000000),                    !B=(000000)
6116            NEXT,   J/GOBUT115C1                            !D=(125252)
    (4622)  DCS[0.00.0.0.0.1]  BM[0000..10.00..11.01..111..111...0.1.0..0..0...0.0100...0..0000.0...11.000...000.010.011]
6117
6118    4023:  !(FREE)
6119    GOBUT115C1:
6120            SETUP,  RETURN/TEST115C2,                       !EXEC SUBR WHICH:
6121                                                            !(1) D<15:12> -> IR<15:12>
6122            NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
    (4023)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
6123
6124    !CHECK BIT<11:06> = "1010 10"
6125    4617:
6126    TEST115C2:
6127            PD,     LOAD-ENUA(ZTARGET412),                  !INSTRS-E78 OUTPUT FOR BIT <11:06> = "101 010"
6128                    LOAD-ERROR(TEST115C2),                  !ERROR DIRECTORY KEY
6129                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6130                    BUMP-VERIFY,                            !COUNT
6131            NEXT,   J/GOBUT115C2                            !
    (4617)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.100]
6132
6133    4024:  !(FREE)
6134    GOBUT115C2:
6135            SETUP,  RETURN/TEST115C3,                       !EXEC SUBR WHICH:
6136                                                            !(1) D<11:06> -> IR<11:06>
6137            NEXT,   CALL[D11-06]                            !(2) BUT(INSTRS) INTO ZTARGET---
    (4024)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
6138
6139
6140
6141    !CHECK BIT<05:00> = "10 1010"
6142    4627:
6143    TEST115C3:
```

```
6144
6145            PO,     LOAD-ENUA(ZTARGET425),                  !INSTR5-E88 OUTPUT FOR BIT<05:00> = "101 010"
6146                    LOAD-ERROR(TEST115C3),                  !ERROR DIRECTORY KEY
6147                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6148            NEXT,   J/GOBUT115C3                            !
    (4627)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.101]
6149
6150    4025:  !(FREE)
6151    GOBUT115C3:
6152            SETUP,  RETURN/TEST115D1,                       !EXEC SUBR WHICH:
6153                                                            !(1) D<05:00> -> IR<05:00>
6154            NEXT,   CALL[D05-00]                            !(2) BUT(INSTR5) INTO ZTARGET---
    (4025)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
6155
6156
6157
6158
6159    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6160
6161    !TESTS 115D 1-3 VERIFIES THAT WITH:
6162    !ALU=(NOT-A, A=(125252), B=(000000), THEN D=(052525)
6163    4626:
6164    TEST115D1:
6165            PO,     LOAD-ENUA(ZTARGET405),                  !BIT<15:12> = "0101"
6166                    LOAD-ERROR(TEST115D1),                  !ERROR DIRECTORY KEY
6167                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6168            NEXT,   J/ALU115D1                              !
    (4626)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.110]
6169
6170    4026:  !(FREE)
6171    ALU115D1:
6172            PO,     BUMP-VERIFY,                            !COUNT
6173            P2-T,   D+NOT-A, SAVE-D[C],                     !ALU=(NOT-A), D[C]+D
6174                    BUS-A+ASPHI(C125252),                   !A=(125252)
6175                    BUS-B+CSPD(C000000),                    !B=(000000)
6176            NEXT,   J/GOBUT115D1                            !D=(052525)
    (4026)  DCS[0.00.0.0.0.1]  BM[0000..10.00..11.01..110..111...0.1.0..0..0...0.0100...0..0000.0...11.000...000.010.111]
6177
6178    4027:  !(FREE)
6179    GOBUT115D1:
6180            SETUP,  RETURN/TEST115D2,                       !EXEC SUBR WHICH:
6181                                                            !(1) D<15:12> -> IR<15:12>
6182            NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
    (4027)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
6183
6184    !CHECK BIT<11:06> = "0101 01"
6185    4625:
6186    TEST115D2:
6187            PO,     LOAD-ENUA(ZTARGET405),                  !INSTR5-E78 OUTPUT FOR BIT<11:06> = "010 101"
6188                    LOAD-ERROR(TEST115D2),                  !ERROR DIRECTORY KEY
6189                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6190                    BUMP-VERIFY,                            !COUNT
```

```
6191            NEXT,   J/GOBUT115D2                                    !
     (4625)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.000]
6192
6193    4030:  !(FREE)
6194    GOBUT115D2:
6195            SETUP,  RETURN/TEST115D3,                               !EXEC SUBR WHICH:
6196                                                                    !(1) D<11:06> -> IR<11:06>
6197            NEXT,   CALL[D11-06]                                    !(2) BUT(INSTR5) INTO ZTARGET---
     (4030)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
6198
6199
6200
6201    !CHECK BIT<05:00> = "01 0101"
6202    4624:
6203    TEST115D3:
6204
6205            PO,     LOAD-ENUA(ZTARGET432),                          !INSTR5-E88 OUTPUT FOR BIT<05:00> = "010 101"
6206                    LOAD-ERROR(TEST115D3),                          !ERROR DIRECTORY KEY
6207                    DCS-CTR(C6.),                                   !COMAPRE AT TARGET
6208            NEXT,   J/GOBUT115D3                                    !
     (4624)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.001]
6209
6210    4031:  !(FREE)
6211    GOBUT115D3:
6212            SETUP,  RETURN/SCOPE115D,                               !EXEC SUBR WHICH:
6213                                                                    !(1) D<05:00> -> IR<05:00>
6214            NEXT,   CALL[D05-00]                                    !(2) BUT(INSTR5) INTO ZTARGET---
     (4031)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
6215
6216    4032:  !(FREE)
6217    SCOPE115D:
6218            PO,     BUMP-VERIFY,                                    !COUNT
6219            NEXT,   BUTD[SCOPE],                                    !NO ERROR: "TEST116A1" (+1. WORDS)
6220                    J/TEST116A1                                     !   ERROR: "ALU115C1"  (-13. WORDS)
     (4032)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.011]
6221
6222
6223
6224
6225    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6226
6227    !THIS NEXT SET OF 12. TESTS EXERCISES THE ALU FUNCTIONS
6228    !"ZERO" AND "NOT-A-AND-B", AND THE D[C] INPUTS "ALU15" AND "D[C]"
6229
6230    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6231
6232    !TESTS 116A 1-5 VERIFIES THAT WITH:
6233    !ALU=(NOT-A-AND-B), A=(000000), B=(125252), THEN D=(125252)
6234    4623:
6235    TEST116A1:
6236            PO,     LOAD-ENUA(ZTARGET412),                          !BIT<15:12> = "1010"
6237                    LOAD-ERROR(TEST116A1),                          !ERROR DIRECTORY KEY
```

```
6238                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6239            NEXT,   J/ALU116A1                              !
    (4623)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.100]
6240
6241    4634:
6242    ALU116A1:
6243            PD,     BUMP-VERIFY,                            !COUNT
6244            P2-T,   D←NOT-A-AND-B, D[C]←ALU15,               !ALU=(NOT-A-AND-B), D[C]=(1)
6245                    BUS-A←ASPHI(C000000),                   !A=(000000)
6246                    BUS-B←CSPD(C125252),                    !B=(125252)
6247            NEXT,   J/GOBUT116A1                            !D=(125252)
    (4634)  DCS[0.00.0.0.0.1]  BM[0010..10.00..11.01..100..100...0.1.0..0..0...0.0110...0..0000.0...11.000...000.011.011]
6248
6249    4033:  !(FREE)
6250    GOBUT116A1:
6251            SETUP,  RETURN/TEST116A2,                       !EXEC SUBR WHICH:
6252                                                            !(1) D<15:12> -> IR<15:12>
6253            NEXT,   CALL[D15-12]                            !(2) BUT (IR15-12) INTO ZTARGET---
    (4033)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
6254
6255    !CHECK THAT D[C] GOT A (1) FROM "ALU15," ABOVE
6256    4621:
6257    TEST116A2:
6258            PD,     LOAD-ENUA(ZTARGET403),                  !BIT <00> = D[C] = (1)
6259                    LOAD-ERROR(TEST116A2),                  !ERROR DIRECTORY KEY
6260                    DCS-CTR(C3.),                           !COMPARE AT TARGET
6261                    BUMP-VERIFY,                            !COUNT
6262            NEXT,   J/GOBUT116A2                            !
    (4621)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.100]
6263    4034:  !(FREE)
6264    GOBUT116A2:
6265            SETUP,  RETURN/TEST116A3,                       !RETURN TO START OF NEXT SUBTEST
6266            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
6267                    J/BUTD[C]A                              !D[C]H IN BIT <00>
    (4034)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
6268
6269    !CHECK BIT<11:06> = "1010 10"
6270    4620:
6271    TEST116A3:
6272            PD,     LOAD-ENUA(ZTARGET412),                  !INSTR5-E78 OUTPUT FOR BIT <11:06> = "101 010"
6273                    LOAD-ERROR(TEST116A3),                  !ERROR DIRECTORY KEY
6274                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6275                    BUMP-VERIFY,                            !COUNT
6276            NEXT,   J/GOBUT116A3                            !
    (4620)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.101]
6277
6278    4035:  !(FREE)
6279    GOBUT116A3:
6280            SETUP,  RETURN/TEST116A4,                       !EXEC SUBR WHICH:
6281                                                            !(1) D<11:06> -> IR<11:06>
6282            NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
```

```
      (4035)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
6283
6284
6285
6286    !CHECK BIT<05:00> = "10 1010"
6287    4637:
6288    TEST116A4:
6289
6290            PO,     LOAD-ENUA(ZTARGET425),                  !INSTR5-E88 OUTPUT FOR BIT <05:00> ="101 010"
6291                    LOAD-ERROR(TEST116A4),                  !ERROR DIRECTORY KEY
6292                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6293            NEXT,   J/GOBUT116A4                            !
      (4637)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.110]
6294
6295    4036:  !(FREE)
6296    GOBUT116A4:
6297            SETUP,  RETURN/TEST116A5,                       !EXEC SUBR WHICH:
6298                                                            !(1) D<05:00> -> IR<05:00>
6299            NEXT,   CALL[D05-00]                            !(2) BUT(INSTR5) INTO ZTARGET---
      (4036)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
6300
6301
6302
6303    !CHECK THAT D[C] WAS PROPOGATED UNCHANGED AS A (1), VIA D[C]←D[C]
6304    4636:
6305    TEST116A5:
6306            PO,     LOAD-ENUA(ZTARGET403),                  !BIT<01> = D[C] = (1)
6307                    LOAD-ERROR(TEST116A5),                  !ERROR DIRECTORY KEY
6308                    DCS-CTR(C3.),                           !COMPARE AT TARGET
6309            NEXT,   J/GOBUT116A5                            !
      (4636)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.111]
6310
6311    4037:  !(FREE)
6312    GOBUT116A5:
6313            SETUP,  RETURN/TEST116B,                        !RETURN TO START OF NEXT SUBTEST
6314            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
6315                    J/BUTD[C]B                              !D[C]H IN BIT <01>
      (4037)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]
6316
6317
6318
6319
6320
6321    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
6322
6323    !TEST 116B VERIFIES THAT WITH:
6324    !ALU=(ZERO), A=(125252), B=(052525), THEN D=(000000)
6325    4606:
6326    TEST116B:
6327            PO,     LOAD-ENUA(ZTARGET434),                  !INSTR5 FOR IR=(000000)
6328                    LOAD-ERROR(TEST116B),                   !ERROR DIRECTORY KEY
6329                    DCS-CTR(C6.),                           !COMPARE AT TARGET
```

```
6330            NEXT,   J/ALU116B                                       !
     (4606)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.000]
6331
6332    4040:  !(FREE)
6333    ALU116B:
6334            P2-T,   D←ZERO, SAVE-D[C],                              !ALU=(ZERO), D[C]=D[C]=(1)
6335                    BUS-A←ASPHI(C125252),                           !A=(125252)
6336                    BUS-B←CSPD(C052525),                            !B=(052525)
6337            NEXT,   J/GOBUT116B                                     !D=(000000)
     (4040)  DCS[0.00.0.0.0.0]  BM[0011..10.00..11.01..110..111...0.1.0..0..0...0.0111...0..0000.0...11.000...000.100.001]
6338
6339    4041:  !(FREE)
6340    GOBUT116B:
6341            SETUP,  RETURN/SCOPE116C,                               !EXEC SUBR WHICH:
6342                                                                    !(1) D-> IR
6343            NEXT,   CALL[DZERO]                                     !(2) BUT(INSTR5) INTO ZTARGET---
     (4041)  DCS[0.00.0.0.0.0]  BM[0100..00.00..01.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.010]
6344
6345
6346
6347    4042:  !(FREE)
6348    SCOPE116C:
6349            NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "TEST116C1"   (+1. WORDS)
6350                    J/TEST116C1                                     !   ERROR:  "ALU116A1"  (-13. WORDS)
     (4042)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.011.101]
6351
6352
6353
6354    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
6355
6356    !TEST 116C 1-5 VERIFIES THAT WITH:
6357    !ALU=(NOT-A-AND-B), A=(000000), B=(052525), THEN D=(052525)
6358    4635:
6359    TEST116C1:
6360            P0,     LOAD-ENUA(ZTARGET405),                          !BIT<15:12> = "0101"
6361                    LOAD-ERROR(TEST116C1),                          !ERROR DIRECTORY KEY
6362                    DCS-CTR(C6.),                                   !COMPARE AT TARGET
6363            NEXT,   J/ALU116C1                                      !
     (4635)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.110]
6364
6365    4646:
6366    ALU116C1:
6367            P0,     BUMP-VERIFY,                                    !COUNT
6368            P2-T,   D←NOT-A-AND-B, D[C]←ALU15,                      !ALU=(NOT-A-AND-B), D[C]=(0)
6369                    BUS-A←ASPHI(C000000),                           !A=(000000)
6370                    BUS-B←CSPD(C052525),                            !B=(052525)
6371            NEXT,   J/GOBUT116C1                                    !D=(052525)
     (4646)  DCS[0.00.0.0.0.1]  BM[0010..10.00..11.01..100..100...0.1.0..0..0...0.0111...0..0000.0...11.000...000.100.011]
6372
6373    4043:  !(FREE)
6374    GOBUT116C1:
6375            SETUP,  RETURN/TEST116C2,                               !EXEC SUBR WHICH:
6376                                                                    !(1) D<15:12> -> IR<15:12>
```

```
6377            NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
     (4043)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
6378
6379    !CHECK THAT D[C] GOT A (0) FROM "ALU15", ABOVE
6380    4633:
6381    TEST116C2:
6382            PO,     LOAD-ENUA(ZTARGET402),                  !BIT <00> = D[C] = (0)
6383                    LOAD-ERROR(TEST116C2),                  !ERROR DIRECTORY KEY
6384                    DCS-CTR(C3.),                           !COMPARE AT TARGET
6385                    BUMP-VERIFY,                            !COUNT
6386            NEXT,   J/GOBUT116C2                            !
     (4633)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.100]
6387
6388    4044:  !(FREE)
6389    GOBUT116C2:
6390            SETUP,  RETURN/TEST116C3,                       !RETURN TO START OF NEXT SUBTEST
6391            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
6392                    J/BUTD[C]A                              !D[C]H IN BIT<00>
     (4044)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
6393
6394    !CHECK BIT<11:06> = "0101 01"
6395    4632:
6396    TEST116C3:
6397            PO,     LOAD-ENUA(ZTARGET405),                  !INSTR5-E78 OUTPUT FOR BIT<11:06>="010 101"
6398                    LOAD-ERROR(TEST116C3),                  !ERROR DIRECTORY KEY
6399                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6400                    BUMP-VERIFY,                            !COUNT
6401            NEXT,   J/GOBUT116C3                            !
     (4632)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.101]
6402
6403    4045:  !(FREE)
6404    GOBUT116C3:
6405            SETUP,  RETURN/TEST116C4,                       !EXEC SUBR WHICH:
6406                                                            !(1) D<11:06>-> IR<11:06>
6407            NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
     (4045)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
6408
6409
6410
6411    !CHECK BIT <05:00> = "01 0101"
6412    4631:
6413    TEST116C4:
6414
6415            PO,     LOAD-ENUA(ZTARGET432),                  !INSTR5-E88 OUTPUT FOR BIT <05:00> = "010 101"
6416                    LOAD-ERROR(TEST116C4),                  !ERROR DIRECTORY KEY
6417            NEXT,   J/GOBUT116C4                            !
     (4631)  DCS[1.00.0.0.0.0]  BM[0000..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.110]
6418
6419    4046:  !(FREE)
6420    GOBUT116C4:
6421            SETUP,  RETURN/TEST116C5,                       !EXEC SUBR WHICH:
```

```
6422                                                    !(1) D<05:00> -> IR<05:00>
6423            NEXT,   CALL[DOS-00]                    !(2) BUT(INSTR5) INTO ZTARGET---
    (4046)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
6424
6425
6426
6427    !CHECK THAT D[C] WAS PROPOGATED UNCHANGED AS A (0), VIA D[C]←D[C]
6428    4630:
6429    TEST116C5:
6430            PO,     LOAD-ENUA(ZTARGET401),          !BIT<01> = D[C] = (0)
6431                    LOAD-ERROR(TEST116C5),          !ERROR DIRECTORY KEY
6432                    DCS-CTR(C3.),                   !COMPARE AT TARGET
6433            NEXT,   J/GOBUT116C5                    !
    (4630)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.111]
6434
6435    4047:  !(FREE)
6436    GOBUT116C5:
6437
6438            SETUP,  RETURN/TEST116D,                !RETURN TO START OF NEXT SUBTEST
6439            NEXT,   GOTO-PAGE(7),                   !BUT TABLE
6440                    J/BUTD[C]B                      !D[C]H IN BIT <01>
    (4047)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]
6441
6442
6443
6444
6445
6446
6447    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6448
6449    !TEST 116D VERIFIES THAT WITH:
6450    !ALU=(ZERO), A=(052525), B=(125252), THEN D=(000000)
6451    4645:
6452    TEST116D:
6453            PO,     LOAD-ENUA(ZTARGET434),          !INSTR5 FOR IR=(000000)
6454                    LOAD-ERROR(TEST116D),           !ERROR DIRECTORY KEY
6455                    DCS-CTR(C6.),                   !COMPARE AT TARGET
6456            NEXT,   J/ALU116D                       !
    (4645)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.000]
6457
6458    4050:  !(FREE)
6459    ALU116D:
6460            P2-T,   D←ZERO, SAVE-D[C],              !ALU=(ZERO), D[C]=D[C]=(0)
6461                    BUS-A←ASPHI(C052525),           !A=(052525)
6462                    BUS-B←CSPD(C125252),            !B=(125252)
6463            NEXT,   J/GOBUT116D                     !D=(000000)
    (4050)  DCS[0.00.0.0.0.0]  BM[0011..10.00..11.01..111..111...0.1.0..0..0...0.0110...0..0000.0...11.000...000.101.001]
6464
6465    4051:  !(FREE)
6466    GOBUT116D:
6467            SETUP,  RETURN/SCOPE116D,               !EXEC SUBR WHICH:
6468                                                    !(1) D  -> IR
```

```
6469                NEXT,   CALL[DZERO]                             !(2) BUT(INSTR5) INTO ZTARGET---
     (4051)  DCS[0.00.0.0.0.0]  BM[0100..00.00..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.010]
6470
6471
6472
6473        4052:  !(FREE)
6474        SCOPE116D:
6475                NEXT,   BUTD[SCOPE],                            !NO ERROR: "TEST117A1" (+1. WORDS)
6476                        J/TEST117A1                             !   ERROR: "ALU116C1"  (-13. WORDS)
     (4052)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.100.111]
6477
6478
6479
6480
6481
6482        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6483
6484        !THIS NEXT SET OF 9. TESTS EXERCIZES THE ALU FUNCTION
6485        !"A-AND-NOT-B", AND THE CARRYOUT OF "CINMUX=D[C]" INTO D[C]
6486
6487
6488
6489
6490        !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6491
6492        !TESTS 117A 1-4 VERIFIES THAT WITH:
6493        !ALU=(A-AND-NOT-B), A=(177777), B=(125252), THEN D=(052525)
6494        4647:
6495        TEST117A1:
6496                PO,     LOAD-ENUA(ZTARGET405),                  !BIT<15:12> = "0101"
6497                        LOAD-ERROR(TEST117A1),                  !ERROR DIRECTORY KEY
6498                        DCS-CTR(C6.),                           !COMPARE AT TARGET
6499                NEXT,   J/ALU117A1                              !
     (4647)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.110]
6500
6501        4666:
6502        ALU117A1:
6503                PO,     BUMP-VERIFY,                            !COUNT
6504                P2-T,   D←A-AND-NOT-B, D[C]←CINMUX,              !ALU=(A-AND-NOT-B), D[C]=CIN=D[C]=(0)
6505                        BUS-A←ASPHI(C177777),                   !A=(177777)
6506                        BUS-B←CSPD(C125252),                    !B=(125252)
6507                NEXT,   J/GOBUT117A1                            !D=(052525)
     (4666)  DCS[0.00.0.0.0.1]  BM[0111..10.00..11.01..101..000...0.1.0..0..0...0.0110...0..0000.0...11.000...000.101.011]
6508
6509        4053:  !(FREE)
6510        GOBUT117A1:
6511                SETUP,  RETURN/TEST117A2,                       !EXEC SUBR WHICH:
6512                                                                !(1) D<15:12> -> IR<15:12>
6513                NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
     (4053)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
6514
6515        !CHECK BIT<11:06> = "0101 01"
```

```
6516    4644:
6517    TEST117A2:
6518            PO,     LOAD-ENUA(ZTARGET405),                  !INSTR5-E78 OUTPUT FOR BIT<11:06>="010 101"
6519                    LOAD-ERROR(TEST117A2),                  !ERROR DIRECTORY KEY
6520                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6521                    BUMP-VERIFY,                            !COUNT
6522            NEXT,   J/GOBUT117A2                            !
    (4644)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.100]
6523
6524    4054:  !(FREE)
6525    GOBUT117A2:
6526            SETUP,  RETURN/TEST117A3,                       !EXEC SUBR WHICH:
6527                                                            !(1) D<11:06> -> IR<11:06>
6528            NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
    (4054)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
6529
6530
6531
6532    !CHECK BIT<05:00> = "01 0101"
6533    4643:
6534    TEST117A3:
6535
6536            PO,     LOAD-ENUA(ZTARGET432),                  !INSTR5-E88 OUTPUT FOR BIT <05:00>="010 101"
6537                    LOAD-ERROR(TEST117A3),                  !ERROR DIRECTORY KEY
6538                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6539            NEXT,   J/GOBUT117A3                            !
    (4643)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.101]
6540
6541    4055:  !(FREE)
6542    GOBUT117A3:
6543            SETUP,  RETURN/TEST117A4,                       !EXEC SUBR WHICH:
6544                                                            !(1) D<05:00> -> IR<05:00>
6545            NEXT,   CALL[D05-00]                            !(2) BUT(INSTR5) INTO ZTARGET---
    (4055)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
6546
6547    !CHECK THAT D[C] GOT A (0) FROM CINMUX, ABOVE
6548    4642:
6549    TEST117A4:
6550            PO,     LOAD-ENUA(ZTARGET413),                  !BIT<02> = D[C] = (0)
6551                    LOAD-ERROR(TEST117A4),                  !ERROR DIRECTORY KEY
6552                    DCS-CTR(C3.),                           !COMPARE AT TARGET
6553                    BUMP-VERIFY,                            !COUNT
6554            NEXT,   J/GOBUT117A4                            !
    (4642)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.110]
6555
6556    4056:  !(FREE)
6557    GOBUT117A4:
6558            SETUP,  RETURN/TEST117B1,                       !RETURN TO START OF NEXT SUBTEST
6559            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
6560                    J/BUTD[C]C                              !D[C]H IN BIT<02>
    (4056)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]
```

```
6561
6562
6563
6564
6565    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6566
6567    !TESTS 117B 1-3 VERIFIES THAT WITH:
6568    !ALU=(A-AND-NOT-B), A=(177777), B=(052525), THEN D=(125252)
6569    4641:
6570    TEST117B1:
6571            PO,     LOAD-ENUA(ZTARGET412),                  !BIT<15:12> = "1010"
6572                    LOAD-ERROR(TEST117B1),                  !ERROR DIRECTORY KEY
6573                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6574            NEXT,   J/ALU117B1                              !
    (4641)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.111]
6575
6576    4057:  !(FREE)
6577    ALU117B1:
6578            PO,     BUMP-VERIFY,                            !COUNT
6579            P2-T,   D←A-AND-NOT-B, D[C]←ALU15,              !ALU=(A-AND-NOT-B), D[C]=ALU15=(1)
6580                    BUS-A←ASPHI(C177777),                   !A=(177777)
6581                    BUS-B←CSPD(C052525),                    !B=(052525)
6582            NEXT,   J/GOBUT117B1                            !D=(125252)
    (4057)  DCS[0.00.0.0.0.1]  BM[0111..10.00..11.01..101..100...0.1.0..0..0...0.0111...0..0000.0...11.000...000.110.000]
6583
6584    4060:  !(FREE)
6585    GOBUT117B1:
6586            SETUP,  RETURN/TEST117B2,                       !EXEC SUBR WHICH:
6587                                                            !(1) D<15:12> -> IR<15:12>
6588            NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
    (4060)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
6589
6590    !CHECK BIT <11:06> = "1010 10"
6591    4640:
6592    TEST117B2:
6593            PO,     LOAD-ENUA(ZTARGET412),                  !INSTR5-E78 OUTPUT FOR BIT <11:06>="101 010"
6594                    LOAD-ERROR(TEST117B2),                  !ERROR DIRECTORY KEY
6595                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6596                    BUMP-VERIFY,                            !COUNT
6597            NEXT,   J/GOBUT117B2                            !
    (4640)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.001]
6598
6599    4061:  !(FREE)
6600    GOBUT117B2:
6601            SETUP,  RETURN/TEST117B3,                       !EXEC SUBR WHICH:
6602                                                            !(1) D<11:06> -> IR<11:06>
6603            NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
    (4061)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
6604
6605
6606
6607    !CHECK BIT<05:00> = "10 1010"
```

```
6608    4657:
6609    TEST117B3:
6610
6611            P0,     LOAD-ENUA(ZTARGET425),                  !INSTR5-E88 OUTPUT FOR BIT <05:00> = "101 010"
6612                    LOAD-ERROR(TEST117B3),                  !ERROR DIRECTORY KEY
6613                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6614            NEXT,   J/GOBUT117B3                            !
    (4657)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.010]
6615
6616    4062:  !(FREE)
6617    GOBUT117C3:
6618            SETUP,  RETURN/TEST117C1,                       !EXEC SUBR WHICH:
6619                                                            !(1) D<05:00> -> IR<05:00>
6620            NEXT,   CALL[D05-00]                            !(2) BUT (INSTR5) INTO ZTARGET---
    (4062)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
6621
6622
6623
6624
6625
6626
6627
6628    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6629
6630    !TESTS 117C 1-2 VERIFIES THAT WITH:
6631    !ALU=(A-AND-NOT-B), A=(000000), B=(000000), THEN D=(000000)
6632    4656:
6633    TEST117C1:
6634            P0,     LOAD-ENUA(ZTARGET434),                  !INSTR5 FOR IR=(000000)
6635                    LOAD-ERROR(TEST117C1),                  !ERROR DIRECTORY KEY
6636                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6637            NEXT,   J/ALU117C1                              !
    (4656)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.011]
6638
6639    4063:  !(FREE)
6640    ALU117C1:
6641            P2-T,   D←A-AND-NOT-B, D[C]←CINMUX,              !ALU=(A-AND-NOT-B), D[C]=CINMUX=D[C]=(1)
6642                    BUS-A←ASPHI(C000000),                   !A=(000000)
6643                    BUS-B←CSPD(C000000),                    !B=(000000)
6644            NEXT,   J/GOBUT117C1                            !
    (4063)  DCS[0.00.0.0.0.0]  BM[0111..10.00..11.01..100..000...0.1.0..0..0...0.0100...0..0000.0...11.000...000.110.100]
6645
6646    4064:  !(FREE)
6647    GOBUT117C1:
6648            SETUP,  RETURN/TEST117C2,                       !EXEC SUBR WHICH:
6649                                                            !(1) D  -> IR
6650            NEXT,   CALL[DZERO]                             !(2) BUT(INSTR5) INTO ZTARGET---
    (4064)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.010]
6651
6652
6653    !CHECK THAT D[C] GOT A (1) FROM CINMUX, ABOVE
6654    4677:
```

```
6655    TEST117C2:
6656            PO,     LOAD-ENUA(ZTARGET417),                  !BIT<02> = D[C] = (1)
6657                    LOAD-ERROR(TEST117C2),                  !ERROR DIRECTORY KEY
6658                    DCS-CTR(C3.),                           !COMPARE AT TARGET
6659            NEXT,   J/GOBUT117C2                            !
    (4677)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.101]
6660
6661    4065:  !(FREE)
6662    GOBUT117C2:
6663            SETUP,  RETURN/SCOPE117C,                       !RETURN TO SCOPE LOOP TEST WORD
6664            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
6665                    J/BUTD[C]C                              !BIT<02> = D[C]H
    (4065)  DCS[0.00.0.0.0.0]  BM[0100..00.00..01.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]
6666
6667
6668
6669    4066:  !(FREE)
6670    SCOPE117C:
6671            NEXT,   BUTD[SCOPE],                            !NO ERROR: "TEST120A1" (+1. WORDS)
6672                    J/TEST120A1                             ! ERROR: "ALU117A1" (-20. WORDS)
    (4066)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.111]
6673
6674
6675    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6676
6677    !THIS NEXT SET OF 7. TESTS EXERCIZES THE ALU FUNCTION
6678    !"A-AND-B", AND THE CARRYOUT OF "CINMUX =(0) INTO D[C]
6679
6680    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6681
6682    !TESTS 120A 1-3 VERIFIES THAT WITH:
6683    !ALU=(A-AND-B), A=(125252), B=(177777), THEN D=(125252)
6684    4667:
6685    TEST120A1:
6686            PO,     LOAD-ENUA(ZTARGET412),                  !BIT<15:12> = "1010"
6687                    LOAD-ERROR(TEST120A1),                  !ERROR DIRECTORY KEY
6688                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6689            NEXT,   J/ALU120A1                              !
    (4667)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.100]
6690
6691    4664:
6692    ALU120A1:
6693            PO,     BUMP-VERIFY,                            !COUNT
6694            P2-T,   D←A-AND-B, D[C]←ALU15,                  !ALU=(A-AND-B), D[C]=(1)
6695                    BUS-A←ASPHI(C125252),                   !A=(125252)
6696                    BUS-B←CSPD(C177777),                    !B=(177777)
6697            NEXT,   J/GOBUT120A1                            !D=(125252)
    (4664)  DCS[0.00.0.0.0.1]  BM[1011..10.00..11.01..110..100...0.1.0..0..0...0.0101...0..0000.0...11.000...000.110.111]
6698
6699    4067:  !(FREE)
6700    GOBUT120A1:
6701            SETUP,  RETURN/TEST120A2,                       !EXEC SUBR WHICH:
6702                                                            !(1) D<15:12>  -> IR<15:12>
```

```
6703                NEXT,   CALL[D15-12]                                !(2) BUT(IR15-12) INTO ZTARGET---
     (4067)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
6704
6705        !CHECK BIT <11:06> = "1010 10"
6706        4655:
6707        TEST120A2:
6708                PO,     LOAD-ENUA(ZTARGET412),                      !INSTRS-E78 OUTPUT FOR BIT <11:06> = "101 010"
6709                        LOAD-ERROR(TEST120A2),                      !ERROR DIRECTORY KEY
6710                        DCS-CTR(C6.),                               !COMPARE AT TARGET
6711                        BUMP-VERIFY,                                !COUNT
6712                NEXT,   J/GOBUT120A2                                !
     (4655)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.000]
6713
6714        4070:  !(FREE)
6715        GOBUT120A2:
6716                SETUP,  RETURN/TEST120A3,                           !EXEC SUBR WHICH:
6717                                                                    !(1) D<11:06> -> IR<11:06>
6718                NEXT,   CALL[D11-06]                                !(2) BUT(INSTRS) INTO ZTARGET---
     (4070)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
6719
6720
6721
6722        !CHECK BIT<05:00> = "10 1010"
6723        4654:
6724        TEST120A3:
6725
6726                PO,     LOAD-ENUA(ZTARGET425),                      !INSTRS-E88 OUTPUT FOR BIT<05:00>="101 010"
6727                        LOAD-ERROR(TEST120A3),                      !ERROR DIRECTORY KEY
6728                        DCS-CTR(C6.),                               !COMPARE AT TARGET
6729                NEXT,   J/GOBUT120A3                                !
     (4654)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.001]
6730
6731        4071:  !(FREE)
6732        GOBUT120A3:
6733                SETUP,  RETURN/TEST12081,                           !EXEC SUBR WHICH:
6734                                                                    !(1) D<05:00> -> IR<05:00>
6735                NEXT,   CALL[D05-00]                                !(2) BUT(INSTRS) INTO ZTARGET---
     (4071)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
6736
6737
6738
6739
6740        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6741
6742        !TESTS 1208 1-4 VERIFIES THAT WITH:
6743        !ALU=(A-AND-B), A=(052525), B=(177777), THEN D=(052525)
6744        4653:
6745        TEST12081:
6746                PO,     LOAD-ENUA(ZTARGET405),                      !BIT<15:12> = "0101"
6747                        LOAD-ERROR(TEST12081),                      !ERROR DIRECTORY KEY
6748                        DCS-CTR(C6.),                               !COMPARE AT TARGET
```

```
6749                    NEXT,   J/ALU12081                              !
     (4653)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.010]
6750
6751       4072:  !(FREE)
6752       ALU12081:
6753
6754                    P2-T,   D+A-AND-B, D[C]+CINMUX,                 !ALU=(A-AND-B), D[C]=CIN=(0)
6755                            BUS-A+ASPHI(C052525),                   !A=(052525)
6756                            BUS-B+CSPD(C177777),                    !B=(177777)
6757                    NEXT,   J/GOBUT12081                            !D=(052525)
     (4072)  DCS[0.00.0.0.0.0]  BM[1011..10.00..11.01..111..000...0.1.0..0..0...0.0101...0..0000.0...11.000...000.111.011]
6758
6759       4073:  !(FREE)
6760       GOBUT12081:
6761                    SETUP,  RETURN/TEST12082,                       !EXEC SUBR WHICH:
6762                                                                    !(1) D<15:12> -> IR<15:12>
6763                    NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
     (4073)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
6764
6765       !CHECK BIT<11:06> = "0101 01"
6766       4652:
6767       TEST12082:
6768                    PD,     LOAD-ENUA(ZTARGET405),                  !INSTR5-E78 OUTPUT FOR BIT<11:06>="010 101"
6769                            LOAD-ERROR(TEST12082),                  !ERROR DIRECTORY KEY
6770                            DCS-CTR(C6.),                           !COMPARE AT TARGET
6771                            BUMP-VERIFY,                            !COUNT
6772                    NEXT,   J/GOBUT12082                            !
     (4652)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.100]
6773
6774       4074:  !(FREE)
6775       GOBUT12082:
6776                    SETUP,  RETURN/TEST12083,                       !EXEC SUBR WHICH:
6777                                                                    !(1) D<11:06> -> IR<11:06>
6778                    NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
     (4074)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
6779
6780
6781
6782       !CHECK BIT<05:00> = "01 0101"
6783       4651:
6784       TEST12083:
6785
6786                    PD,     LOAD-ENUA(ZTARGET432),                  !INSTR5-E88 OUTPUT FOR BIT <05:00>="010 101"
6787                            LOAD-ERROR(TEST12083),                  !ERROR DIRECTORY KEY
6788                            DCS-CTR(C6.),                           !COMPARE AT TARGET
6789                    NEXT,   J/GOBUT12083                            !
     (4651)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.101]
6790
6791       4075:  !(FREE)
6792       GOBUT12083:
6793                    SETUP,  RETURN/TEST12084,                       !EXEC SUBR WHICH:
6794                                                                    !(1) D<05:00> -> IR<05:00>
```

```
6795                NEXT,   CALL[DOS-00]                            !(2) BUT(INSTR5) INTO ZTARGET---
     (4075)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
6796
6797        !CHECK THAT D[C] GOT A (0) FROM "CINMUX" = (0)
6798        4650:
6799        TEST1208H:
6800                PO,     LOAD-ENUA(ZTARGET402),                  !BIT<00> = D[C] = (0)
6801                        LOAD-ERROR(TEST1208H),                  !ERROR DIRECTORY KEY
6802                        DCS-CTR(C3.),                           !COMPARE AT TARGET
6803                        BUMP-VERIFY,                            !COUNT
6804                NEXT,   J/GOBUT1208H                            !
     (4650)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.110]
6805
6806        4076:  !(FREE)
6807        GOBUT1208H:
6808                SETUP,  RETURN/SCOPE1208,                       !RETURN TO SCOPE LOOP TEST WORD
6809                NEXT,   GOTO-PAGE(7),                           !BUT TABLE
6810                        J/BUTD[C]A                              !D[C]H IN BIT <00>
     (4076)  DCS[0.00.0.0.0.0]  BM[0100..00.00..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
6811
6812        4077:  !(FREE)
6813        SCOPE1208:
6814                NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST121A1" (+1. WORDS)
6815                        J/TEST121A1                             !   ERROR:  "ALU120A1"  (-15. WORDS)
     (4077)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.101]
6816
6817
6818
6819
6820
6821        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6822
6823        !THIS NEXT SET OF 16. TESTS EXERCIZES THE ALU FUNCTION
6824        !"A-XOR-B", AND THE CARRYOUT FUNCTIONS OF "ALU00" AND "ALU07" INTO D[C]
6825
6826        !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6827
6828
6829        !TESTS 121A 1-4 VERIFIES THAT WITH:
6830        !ALU=(A-XOR-B), A=(000000), B=(052525), THEN D=(052525)
6831        4665:
6832        TEST121A1:
6833                PO,     LOAD-ENUA(ZTARGET405),                  !BIT<15:12> = "0101"
6834                        LOAD-ERROR(TEST121A1),                  !ERROR DIRECTORY KEY
6835                        DCS-CTR(C6.),                           !COMPARE AT TARGET
6836                NEXT,   J/ALU121A1                              !
     (4665)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.110]
6837
6838        4706:
6839        ALU121A1:
6840                PO,     BUMP-VERIFY,                            !COUNT
6841                P2-T,   D←A-XOR-B, D[C]←ALU00,                  !ALU=(A-XOR-B), D[C]=ALU00=(1)
```

```
6842                    BUS-A←ASPHI(C000000),                   !A=(000000)
6843                    BUS-B←CSPD(C052525),                    !B=(052525)
6844            NEXT,   J/GOBUT121A1                            !D=(052525)
     (4706)  DCS[0.00.0.0.0.1]  BM[0110..10.00..11.01..100..010...0.1.0..0..0...0.0111...0..0000.0...11.000...001.000.011]
6845
6846    4103:  !(FREE)
6847    GOBUT121A1:
6848            SETUP,  RETURN/TEST121A2,                       !EXEC SUBR WHICH:
6849                                                            !(1) D<15:12> -> IR<15:12>
6850            NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
     (4103)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
6851
6852    !CHECK BIT<11:06> = "0101 01"
6853    4676:
6854    TEST121A2:
6855            PO,     LOAD-ENUA(ZTARGET405),                  !INSTR5-E78 OUTPUT FOR BIT<11:06>="010 101"
6856                    LOAD-ERROR(TEST121A2),                  !ERROR DIRECTORY KEY
6857                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6858                    BUMP-VERIFY,                            !COUNT
6859            NEXT,   J/GOBUT121A2                            !
     (4676)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.100]
6860
6861    4104:  !(FREE)
6862    GOBUT121A2:
6863            SETUP,  RETURN/TEST121A3,                       !EXEC SUBR WHICH:
6864                                                            !(1) D<11:06> -> IR<11:06>
6865            NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
     (4104)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
6866
6867
6868
6869    !CHECK BIT<05:00> = "01 0101"
6870    4675:
6871    TEST121A3:
6872            PO,     LOAD-ENUA(ZTARGET432),                  !INSTR5-E88 OUTPUT FOR BIT<05:00>="010 101"
6873                    LOAD-ERROR(TEST121A3),                  !ERROR DIRECTORY KEY
6874                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6875            NEXT,   J/GOBUT121A3                            !
     (4675)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.101]
6876
6877    4105:  !(FREE)
6878    GOBUT121A3:
6879            SETUP,  RETURN/TEST121A4,                       !EXEC SUBR WHICH:
6880                                                            !(1) D<05:00> -> IR<05:00>
6881            NEXT,   CALL[D05-00]                            !(2) BUT(INSTR5) INTO ZTARGET---
     (4105)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
6882
6883    !CHECK THAT D[C] GOT A (1) FROM "ALU00"
6884    4674:
6885    TEST121A4:
6886            PO,     LOAD-ENUA(ZTARGET403),                  !BIT<01> = D[C] = (1)
```

```
6887                    LOAD-ERROR(TEST121A4),                  !ERROR DIRECTORY KEY
6888                    DCS-CTR(C3.),                           !COMPARE AT TARGET
6889                    BUMP-VERIFY,                            !COUNT
6890            NEXT,   J/GOBUT121A4                            !
    (4674)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.110]
6891
6892    4106:  !(FREE)
6893    GOBUT121A4:
6894            SETUP,  RETURN/TEST121B1,                       !RETURN TO START OF NEXT SUBTEST
6895            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
6896                    J/BUTD[C]B                              !D[C]H IN BIT<01>
    (4106)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]
6897
6898
6899
6900
6901    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
6902
6903    !TESTS 121B 1-4 VERIFIES THAT WITH:
6904    !ALU=(A-XOR-B), A=(177777), B=(052525), THEN D=(125252)
6905    4663:
6906    TEST121B1:
6907            P0,     LOAD-ENUA(ZTARGET412),                  !BIT<15:12> = "1010"
6908                    LOAD-ERROR(TEST121B1),                  !ERROR DIRECTORY KEY
6909                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6910            NEXT,   J/ALU121B1                              !
    (4663)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.111]
6911
6912    4107:  !(FREE)
6913    ALU121B1:
6914            P0,     BUMP-VERIFY,                            !COUNT
6915            P2-T,   D←A-XOR-B, D[C]←ALU00,                  !ALU=(A-XOR-B), D[C]=ALU00=(0)
6916                    BUS-A←ASPHI(C177777),                   !A=(177777)
6917                    BUS-B←CSPD(C052525),                    !B=(052525)
6918            NEXT,   J/GOBUT121B1                            !D=(125252)
    (4107)  DCS[0.00.0.0.0.1]  BM[0110..10.00..11.01..101..010...0.1.0..0..0...0.0111...0..0000.0...11.000...001.001.000]
6919
6920    4110:  !(FREE)
6921    GOBUT121B1:
6922            SETUP,  RETURN/TEST121B2,                       !EXEC SUBR WHICH:
6923                                                            !(1) D<15:12> -> IR<15:12>
6924            NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
    (4110)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
6925
6926    !CHECK BIT<11:06> = "1010 10"
6927    4662:
6928    TEST121B2:
6929            P0,     LOAD-ENUA(ZTARGET412),                  !INSTR5-E78 OUTPUT FOR BIT<11:06>="101 010"
6930                    LOAD-ERROR(TEST121B2),                  !ERROR DIRECTORY KEY
6931                    DCS-CTR(C6.),                           !COMPARE AT TARGET
6932                    BUMP-VERIFY,                            !COUNT
6933            NEXT,   J/GOBUT121B2                            !
```

```
     (4662)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.001]
6934
6935     4111:  !(FREE)
6936     GOBUT12182:
6937             SETUP,  RETURN/TEST12183,                          !EXEC SUBR WHICH:
6938                                                                !(1) D<11:06> -> IR<11:06>
6939             NEXT,   CALL[D11-06]                               !(2) BUT(INSTR5) INTO ZTARGET---
     (4111)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
6940
6941
6942
6943     !CHECK BIT<05:00> = "10 1010"
6944     4661:
6945     TEST12183:
6946
6947             PO,     LOAD-ENUA(ZTARGET425),                     !INSTR5-E88 OUTPUT FOR BIT<05:00>="101 010"
6948                     LOAD-ERROR(TEST12183),                     !ERROR DIRECTORY KEY
6949                     DCS-CTR(C6.),                              !COMPARE AT TARGET
6950             NEXT,   J/GOBUT12183                               !
     (4661)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.010]
6951
6952     4112:  !(FREE)
6953     GOBUT12183:
6954             SETUP,  RETURN/TEST12184,                          !EXEC SUBR WHICH:
6955                                                                !(1) D<05:00) -> IR<05:00>
6956             NEXT,   CALL[D05-00]                               !(2) BUT(INSTR5) INTO ZTARGET---
     (4112)  DCS[0.00.0.0.0.0]  BM[0100..00.11..01.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
6957
6958     !CHECK THAT D[C] GOT A (0) FROM "ALU00"
6959     4660:
6960     TEST12184:
6961             PO,     LOAD-ENUA(ZTARGET401),                     !BIT<01> = D[C] = (0)
6962                     LOAD-ERROR(TEST12184),                     !ERROR DIRECTORY KEY
6963                     DCS-CTR(C3.),                              !COMPARE AT TARGET
6964                     BUMP-VERIFY,                               !COUNT
6965             NEXT,   J/GOBUT12184                               !
     (4660)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.011]
6966
6967     4113:  !(FREE)
6968     GOBUT12184:
6969             SETUP,  RETURN/SCOPE121C,                          !RETURN TO SCOPE LOOP TEST WORD
6970             NEXT,   GOTO-PAGE(7),                              !BUT TABLE
6971                     J/BUTD[C]B                                 !D[C]H IN BIT<01]
     (4113)  DCS[0.00.0.0.0.0]  BM[0100..00.00..10.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]
6972
6973
6974
6975     4114:  !(FREE)
6976     SCOPE121C:
6977             NEXT,   BUTD[SCOPE],                               !NO ERROR:  "TEST121C1"   (+1. WORDS)
6978                     J/TEST121C1                                !   ERROR:  "ALU121A1"  (-17. WORDS)
```

```
     (4114)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.111]
 6979
 6980
 6981
 6982    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 6983
 6984    !TESTS 121C 1-4 VERIFIES THAT WITH:
 6985    !ALU=(A-XOR-B), A=(000000), B=(125252), THEN D=(125252)
 6986    4707:
 6987    TEST121C1:
 6988            PO,     LOAD-ENUA(ZTARGET412),                  !BIT<15:12> = "1010"
 6989                    LOAD-ERROR(TEST121C1),                  !ERROR DIRECTORY KEY
 6990                    DCS-CTR(C6.),                           !COMPARE AT TARGET
 6991            NEXT,   J/ALU121C1                              !
     (4707)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.000]
 6992
 6993    4670:
 6994    ALU121C1:
 6995            PO,     BUMP-VERIFY,                            !COUNT
 6996            P2-T,   D←A-XOR-B, D[C]←ALU07,                  !ALU=(A-XOR-B), D[C]=ALU07=(1)
 6997                    BUS-A←ASPHI(C000000),                   !A=(000000)
 6998                    BUS-B←CSPD(C125252),                    !B=(125252)
 6999            NEXT,   J/GOBUT121C1                            !D=(125252)
     (4670)  DCS[0.00.0.0.0.1]  BM[0110..10.00..11.01..100..011...0.1.0..0..0...0.0110...0..0000.0...11.000...001.001.101]
 7000
 7001    4115:  !(FREE)
 7002    GOBUT121C1:
 7003            SETUP,  RETURN/TEST121C2,                       !EXEC SUBR WHICH:
 7004                                                            !(1) D<15:12> -> IR<15:12>
 7005            NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
     (4115)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
 7006
 7007    !CHECK BIT<11:06> = "1010 10"
 7008    4605:
 7009    TEST121C2:
 7010            PO,     LOAD-ENUA(ZTARGET412),                  !INSTR5-E78 OUTPUT FOR BIT<11:06>="101 010"
 7011                    LOAD-ERROR(TEST121C2),                  !ERROR DIRECTORY KEY
 7012                    DCS-CTR(C6.),                           !COMPARE AT TARGET
 7013                    BUMP-VERIFY,                            !COUNT
 7014            NEXT,   J/GOBUT121C2                            !
     (4605)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.110]
 7015
 7016    4116:  !(FREE)
 7017    GOBUT121C2:
 7018            SETUP,  RETURN/TEST121C3,                       !EXEC SUBR WHICH:
 7019                                                            !(1) D<11:06> -> IR<11:06>
 7020            NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
     (4116)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
 7021
 7022
 7023    !CHECK BIT<05:00> = "10 1010"
 7024    4717:
```

```
7025    TEST121C3:
7026
7027            PO,     LOAD-ENUA(ZTARGET425),                  !INSTR5-E88 OUTPUT FOR BIT<05:00>="101 010"
7028                    LOAD-ERROR(TEST121C3),                  !ERROR DIRECTORY KEY
7029                    DCS-CTR(C6.),                           !COMPARE AT TARGET
7030            NEXT,   J/GOBUT121C3                            !
    (4717)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.111]
7031
7032    4117:  !(FREE)
7033    GOBUT121C3:
7034            SETUP,  RETURN/TEST121C4,                       !EXEC SUBR WHICH:
7035                                                            !(1) D<05:00> -> IR<05:00>
7036            NEXT,   CALL[D05-00]                            !(2) BUT(INSTR5) INTO ZTARGET---
    (4117)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
7037
7038    !CHECK THAT D[C] GOT A (1) FROM "ALU07"
7039    4716:
7040    TEST121C4:
7041            PO,     LOAD-ENUA(ZTARGET417),                  !BIT<02> = D[C] = (1)
7042                    LOAD-ERROR(TEST121C4),                  !ERROR DIRECTORY KEY
7043                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7044                    BUMP-VERIFY,                            !COUNT
7045            NEXT,   J/GOBUT121C4                            !
    (4716)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.000]
7046
7047    4120:  !(FREE)
7048    GOBUT121C4:
7049            SETUP,  RETURN/TEST121D1,                       !RETURN TO START OF NEXT SUBTEST
7050            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7051                    J/BUTD[C]C                              !D[C]H IN BIT<02>
    (4120)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]
7052
7053
7054
7055
7056    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7057
7058    !TESTS 121D 1-4 VERIFIES THAT WITH:
7059    !ALU=(A-XOR-B), A=(177777), B=(125252), THEN D=(052525)
7060    4727:
7061    TEST121D1:
7062            PO,     LOAD-ENUA(ZTARGET405),                  !BIT<15:12> = "0101"
7063                    LOAD-ERROR(TEST121D1),                  !ERROR DIRECTORY KEY
7064                    DCS-CTR(C6.),                           !COMPARE AT TARGET
7065            NEXT,   J/ALU121D1                              !
    (4727)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.001]
7066
7067    4121:  !(FREE)
7068    ALU121D1:
7069            PO,     BUMP-VERIFY,                            !COUNT
7070            P2-T,   D←A-XOR-B, D[C]←ALU07,                  !ALU=(A-XOR-B), D[C]=ALU07=(0)
7071                    BUS-A←ASPHI(C177777),                   !A=(177777)
```

```
7072                    BUS-B←CSPD(C125252),                    !B=(125252)
7073            NEXT,   J/GOBUT121D1                            !D=(052525)
    (4121)  DCS[0.00.0.0.0.1]  BM[0110..10.00..11.01..101..011...0.1.0..0..0...0.0110...0..0000.0...11.000...001.010.010]
7074
7075    4122:  !(FREE)
7076    GOBUT121D1:
7077            SETUP,  RETURN/TEST121D2,                       !EXEC SUBR WHICH:
7078                                                            !(1) D<15:12> -> IR<15:12>
7079            NEXT,   CALL[D15-12]                            !(2) BUT(IR15-12) INTO ZTARGET---
    (4122)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.100]
7080
7081    !CHECK BIT<11:06> = "0101 01"
7082    4726:
7083    TEST121D2:
7084            PO,     LOAD-ENUA(ZTARGET405),                  !INSTR5-E78 OUTPUT FOR BIT<11:06>="010 101"
7085                    LOAD-ERROR(TEST121D2),                  !ERROR DIRECTORY KEY
7086                    DCS-CTR(C6.),                           !COMPARE AT TARGET
7087                    BUMP-VERIFY,                            !COUNT
7088            NEXT,   J/GOBUT121D2                            !
    (4726)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.011]
7089
7090    4123:  !(FREE)
7091    GOBUT121D2:
7092            SETUP,  RETURN/TEST121D3,                       !EXEC SUBR WHICH:
7093                                                            !(1) D<11:06> -> IR<11:06>
7094            NEXT,   CALL[D11-06]                            !(2) BUT(INSTR5) INTO ZTARGET---
    (4123)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.110]
7095
7096
7097
7098    !CHECK BIT<05:00> = "01 0101"
7099    4737:
7100    TEST121D3:
7101
7102            PO,     LOAD-ENUA(ZTARGET432),                  !INSTR5-E88 OUTPUT FOR BIT<05:00>="010 101"
7103                    LOAD-ERROR(TEST121D3),                  !ERROR DIRECTORY KEY
7104                    DCS-CTR(C6.),                           !COMPARE AT TARGET
7105            NEXT,   J/GOBUT121D3                            !
    (4737)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.100]
7106
7107    4124:  !(FREE)
7108    GOBUT121D3:
7109            SETUP,  RETURN/TEST121D4,                       !EXEC SUBR WHICH:
7110                                                            !(1) D<05:00> -> IR<05:00>
7111            NEXT,   CALL[D05-00]                            !(2) BUT(INSTR5) INTO ZTARGET---
    (4124)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.000]
7112
7113    !CHECK THAT D[C] GOT A (0) FROM "ALU07"
7114    4736:
7115    TEST121D4:
7116            PO,     LOAD-ENUA(ZTARGET413),                  !BIT<02> = D[C] = (0)
```

```
                    LOAD-ERROR(TEST121D4),                  !ERROR DIRECTORY KEY
                    DCS-CTR(C3.),                           !COMPARE AT TARGET
                    BUMP-VERIFY,                            !COUNT
            NEXT,   J/GOBUT121D4                            !
    (4736)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.101]

    4125:  !(FREE)
    GOBUT121D4:
            SETUP,  RETURN/SCOPE121D,                       !RETURN TO SCOPE LOOP TEST WORD
            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                    J/BUTD[C]C                              !D[C]H IN BIT<02>
    (4125)  DCS[0.00.0.0.0.0]  BM[0100..00.00..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]

    4126:  !(FREE)
    SCOPE121D:
            PO,     BUMP-VERIFY,                            !COUNT
            NEXT,   BUTD[SCOPE],                            !NO ERROR: "TEST122A1" (+1. WORDS)
                    J/TEST122A1                             !    ERROR:  "ALU121C1" (-17. WORDS)
    (4126)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.001]


    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    !THIS NEXT SET OF 8. TESTS CHECK THE ALU FUNCTIONS "A"
    !AND "A-IOR-B", THE FUNCTION D[C]=CINMUX=(1), AND ALSO
    !THE BUT(D<14:00>=ZERO#D<15>) BUT FOR D=(0)(00000) AND
    !D=(1)(25252)
    4671:
    TEST122A1:
            PO,     LOAD-EMUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
                    LOAD-ERROR(TEST122A1),                  !ERROR DIRECTORY KEY
                    DCS-CTR(C6.),                           !COMPARE AT TARGET
            NEXT,   J/ALU122A1                              !
    (4671)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.010]

    4672:
    ALU122A1:
            PO,     BUMP-VERIFY,                            !COUNT
            P2-T,   D←A-IOR-B, D[C]←CINMUX,                 !ALU=(A-IOR-B), D[C]=CINMUX=(1)
                    BUS-A←ASPHI(C000000),                   !A=(000000)
                    BUS-B←BSPHI(C000000),                   !B=(000000)
            NEXT,   J/GOBUT122A1                            !D=(000000)
    (4672)  DCS[0.00.0.0.0.1]  BM[1110..01.11..11.01..100..000...0.1.0..0..0...0.0000...0..0000.0...11.000...001.010.111]

    4127:  !(FREE)
    GOBUT122A1:
            SETUP,  RETURN/TEST122A2,                       !EXEC SUBR WHICH:
```

```
7165                                                    !(1) D -> IR
7166            NEXT,   CALL[DZERO]                     !(2) BUT(INSTR5) INTO ZTARGET---
    (4127)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.010]
7167
7168
7169
7170    !CHECK THAT D[C] GOT A (1) FROM CINMUX=(1)
7171    4570:
7172    TEST122A2:
7173            PO,     LOAD-ENUA(ZTARGET403),          !BIT<00> = D[C] = (1)
7174                    LOAD-ERROR(TEST122A2),          !ERROR DIRECTORY KEY
7175                    DCS-CTR(C3.),                   !COMPARE AT TARGET
7176            NEXT,   J/GOBUT122A2                    !
    (4570)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.000]
7177
7178    4130:  !(FREE)
7179    GOBUT122A2:
7180            SETUP,  RETURN/TEST122A3,               !RETURN TO START OF NEXT SUBTEST
7181            NEXT,   GOTO-PAGE(7),                   !BUT TABLE
7182                    J/BUTD[C]A                      !D[C]H IN BIT <00>
    (4130)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
7183
7184
7185
7186    !CHECK THAT D<15>=0, [D<14:00>=ZERO]=1 WHEN D=(000000)
7187    4734:
7188    TEST122A3:
7189            PO,     LOAD-ENUA(ZTARGET402),          !SETUP FOR D<15:00>=ZERO
7190                    LOAD-ERROR(TEST122A3),          !ERROR DIRECTORY KEY
7191                    DCS-CTR(C3.),                   !COMPARE AT TARGET
7192            NEXT,   J/GOBUT122A3                    !
    (4734)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.001]
7193
7194    4131:  !(FREE)
7195    GOBUT122A3:
7196            SETUP,  RETURN/TEST122A4,               !RETURN TO START OF NEXT SUBTEST
7197            NEXT,   GOTO-PAGE(7),                   !BUT TABLE
7198                    J/BUTD-IS-ZERO                  !BIT<1:0> = D<15># D<14:00>=ZERO
    (4131)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
7199
7200    !CHECK THAT D<15>=(1), [D<14:00>=ZERO]=(0) WHEN D=(125252)
7201    4735:
7202    TEST122A4:
7203            PO,     LOAD-ENUA(ZTARGET401),          !SETUP FOR D<15:00>=(125252)
7204                    LOAD-ERROR(TEST122A4),          !ERROR DIRECTORY KEY
7205                    DCS-CTR(C4.),                   !COMPARE AT TARGET
7206                    BUMP-VERIFY,                    !COUNT
7207            NEXT,   J/SETD122A4                     !
    (4735)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.010]
7208
7209    4132:  !(FREE)
```

```
7210    SETD122A4:
7211            P2-T,   D←CSPD(C125252), D[C]←0,                !SETUP D FOR TEST
7212            NEXT,   J/GOBUT122A4                            !
    (4132)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0110...0..0000.0...11.000...001.011.011]
7213
7214    4133:  !(FREE)
7215    GOBUT122A4:
7216            SETUP,  RETURN/SCOPE122A,                       !RETURN TO SCOPE LOOP TEST WORD
7217            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7218                    J/BUTD-IS-ZERO                          !BIT<1:0> = D15#[D<14:00>=ZERO]
    (4133)  DCS[0.00.0.0.0.0]  BM[0100..00.00..10.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
7219
7220
7221
7222    4134:  !(FREE)
7223    SCOPE122A:
7224            P0,     BUSDIN←EMIT-[I],                        !RESET PROC UCON
7225                    EN-CLK-IR[15-00],                       !
7226            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST130A1"   (+1. WORDS)
7227                    J/TEST130A1                             !   ERROR:  "ALU122A1"  (-8. WORDS)
    (4134)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.111.011]
7228
7229
7230
7231
7232
7233    !.PAGE=============================================================================================================
7234
7235
7236    .TOC   *   TEST130-136:  ALU ARITHMETIC FUNCTION/CARRY LOOKAHEAD TESTS
7237
7238    !*************************************************************************************************
7239    !*
7240    !*      TESTS:  130 - 136                                   UWORDS:  127 + 160
7241    !*
7242    !*      FUNCTIONS:
7243    !*
7244    !*      ALU ARITHMETIC FUNCTION DECODE, INTERNAL CARRIES, CARRYOUTS, CARRY LOOKAHEAD.
7245    !*
7246    !*************************************************************************************************
7247
7248    !
7249    !       SUMMARY OF ALU ARITHMETIC / CARRY LOOKAHEAD TESTS:
7250    !
7251    !       TEST            OPERANDS EMPLOYED:
7252    !       NUMB            (A/B)+(B/A)+(CIN)=(COUT)(D)     ALU FUNCTION
7253    !       ----            ---------------------------     ------------------
7254    !
7255    !       130A            (0101)+(0101)+(0)=(0)(1010)     A-PLUS-B-PLUS-0
7256    !       130B            (1010)+(1010)+(1)=(1)(0101)     A-PLUS-B-PLUS-1
7257    !
7258    !       131A            (1010)+(0101)+(0)=(0)(1111)     A-PLUS-B-PLUS-PS[C]
7259    !       131B            (0101)+(1010)+(0)=(0)(1111)     DIVIDE/D[C]=0/A-PLUS-B-PLUS-0
```

```
7260    !
7261    !       132A            (1010)-(1010)-(0)=(1)(0000)     A-MINUS-B-MINUS-0
7262    !       132B            (0101)-(0101)-(0)=(1)(0000)     DIVIDE/D[C]=1/A-MINUS-B-MINUS-0
7263    !
7264    !       133A            (1000)+(1000)+(0)=(1)(0000)     A-PLUS-B-PLUS-D[C]
7265    !       133B            (0111)+(0111)+(1)=(0)(1111)     A-PLUS-NOT-B-PLUS-D[C]
7266    !
7267    !       134A            (0100)+(1100)+(0)=(1)(0000)     A-PLUS-B-PLUS-D[C]
7268    !       134B            (1011)+(0011)+(1)=(0)(1111)     A-PLUS-NOT-B-PLUS-D[C]
7269    !
7270    !       135A            (1010)+(0110)+(0)=(1)(0000)     A-PLUS-B-PLUS-D[C]
7271    !       135B            (0101)+(1001)+(1)=(0)(1111)     A-PLUS-NOT-B-PLUS-D[C]
7272    !
7273    !       136A            (0101)+(1011)+(0)=(1)(0000)     A-PLUS-B-PLUS-D[C]
7274    !       136B            (1010)+(0100)+(1)=(0)(1111)     A-PLUS-NOT-B-PLUS-D[C]
7275    !
7276    !
7277    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7278
7279    !CHECK INTERNAL ALU CARRIES WITH:      (052525)+(052525)+(0)=(125252)
7280    !ALSO CHECK ALU FUNCTION "A-PLUS-B-PLUS-0", D[C]←COUT15=(0)
7281    !
7282    4673:
7283    TEST130A1:
7284            P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTR5 TEST
7285                    LOAD-ERROR(TEST130A1),                  !ERROR DIRECTORY KEY
7286                    DCS-CTR(C8.),                           !COMPARE AT TARGET
7287            NEXT,   J/ARITH130A1                            !
    (4673)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.000]
7288
7289    4540:
7290    ARITH130A1:
7291            P2-T,   D←A-PLUS-B-PLUS-0,                      !ALU=(A-PLUS-B), CIN=(0)
7292                    D[C]←COUT15,                            !GET CARRYOUT
7293                    BUS-A←ASPHI(C052525),                   !A=(052525)
7294                    BUS-B←BSPHI(C052525),                   !B=(052525)
7295                    SR←A-PLUS-B-PLUS-0,                     !D=(125252), COUT15=(0)
7296            NEXT,   J/COMP130A1                             !
    (4540)  DCS[0.00.0.0.0.0]  BM[1001..01.11..11.01..111..110...0.1.1..0..0...0.0000...0..0000.0...11.000...001.011.101]
7297
7298    4135:  !(FREE)
7299    COMP130A1:
7300            P0,     BUMP-VERIFY,                            !COUNT
7301            P2-T,   D←SR-XOR-CSPD(C125252),                 !COMPARE RECEIVED: EXPECTED
7302                    SAVE-D[C],                              !SAVE CARRY
7303            NEXT,   J/GOBUT130A1                            !
    (4135)  DCS[0.00.0.0.0.1]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.0110...0..0000.0...11.000...001.011.110]
7304
7305    4136:  !(FREE)
7306    GOBUT130A1:
7307            SETUP,  RETURN/TEST130A2,                       !RETURN TO START OF NEXT SUBTEST
7308            NEXT,   CALL[DINTOIR-5]                         !GO PUT D -> IR, BUT(INSTR5)
    (4136)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
```

```
7309
7310
7311
7312    !CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
7313    4550:
7314    TEST130A2:
7315            PO,     LOAD-ENUA(ZTARGET402),                  !BIT<00> CLEAR
7316                    LOAD-ERROR(TEST130A2),                  !ERROR DIRECTORY KEY
7317                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7318            NEXT,   J/GOBUT130A2                            !
    (4550)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.111]
7319
7320    4137:  !(FREE)
7321    GOBUT130A2:
7322            SETUP,  RETURN/TEST13081,                       !RETURN TO START OF NEXT SUBTEST
7323            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7324                    J/BUTD[C]A                              !D[C]H= COUT15 H IN BIT<00>
    (4137)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
7325
7326
7327
7328    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7329
7330    !CHECK INTERNAL ALU CARRIES WITH: (125252)+(125252)+(1)=(052525)
7331    !ALSO CHECK ALU FUNCTION "A-PLUS-B-PLUS-1", D[C]+COUT15=(1)
7332    !
7333    4530:
7334    TEST13081:
7335            PO,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS TEST
7336                    LOAD-ERROR(TEST13081),                  !ERROR DIRECTORY KEY
7337                    DCS-CTR(C8.),                           !COMPARE AT TARGET
7338            NEXT,   J/ARITH13081                            !
    (4530)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.000]
7339
7340    4140:  !(FREE)
7341    ARITH13081:
7342            P2-T,   D+A-PLUS-B-PLUS-1,                      !ALU=(A-PLUS-B), CIN=(1)
7343                    D[C]+COUT15,                            !GET CARRYOUT
7344                    BUS-A+ASPHI[C125252),                   !A=(125252)
7345                    BUS-B+BSPHI[C125252),                   !B=(125252)
7346                    SR+A-PLUS-B-PLUS-1,                     !D=(052525), COUT15=(1)
7347            NEXT,   J/COMP13081                             !
    (4140)  DCS[0.00.0.0.0.0]  BM[1100..01.11..11.01..110..110...0.1.1..0..0...0.0000...0..0000.0...11.000...001.100.001]
7348
7349    4141:  !(FREE)
7350    COMP13081:
7351            PO,     BUMP-VERIFY,                            !COUNT
7352            P2-T,   D+SR-XOR-CSPD(C052525),                 !COMPARE RECEIVED: EXPECTED
7353                    SAVE-D[C],                              !SAVE CARRY
7354            NEXT,   J/GOBUT13081                            !
    (4141)  DCS[0.00.0.0.0.1]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.0111...0..0000.0...11.000...001.100.010]
7355
7356    4142:  !(FREE)
```

```
7357    GOBUT13081:
7358            SETUP,  RETURN/TEST13082,                       !RETURN TO START OF NEXT SUBTEST
7359            NEXT,   CALL[DINTOIR-5]                         !GO PUT D -> IR, BUT(INSTRS)
     (4142)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
7360
7361
7362
7363    !CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
7364    4532:
7365    TEST13082:
7366            PO,     LOAD-ENUA(ZTARGET403),                  !BIT<00> SET
7367                    LOAD-ERROR(TEST13082),                  !ERROR DIRECTORY KEY
7368                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7369            NEXT,   J/GOBUT13082                            !
     (4532)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.011]
7370
7371    4143:  !(FREE)
7372    GOBUT13082:
7373            SETUP,  RETURN/SCOPE1308,                       !RETURN TO SCOPE LOOP TEST WORD
7374            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7375                    J/BUTD[C]A                              !D[C]H= COUT15 H IN BIT<00>
     (4143)  DCS[0.00.0.0.0.0]  BM[0100..00.00..11.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
7376
7377
7378
7379    4144:  !(FREE)
7380    SCOPE1308:
7381            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST131A1"  (+1.WORDS)
7382                    J/TEST131A1'                            !   ERROR:  "ARITH130A1" (-11.WORDS)
     (4144)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.001]
7383
7384
7385
7386    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7387
7388    !CHECK INTERNAL ALU CARRIES WITH: (125252)+(052525)+(0)=(177777)
7389    !ALSO CHECK ALU FUNCTION "A-PLUS-B-PLUS-PS[C]", D[C]←COUT15=(0)
7390    !CIN=PS[C]=(0) FROM INITIALIZATION ROUTINE
7391    4541:
7392    TEST131A1:
7393            PO,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS TEST
7394                    LOAD-ERROR(TEST131A1),                  !ERROR DIRECTORY KEY
7395                    DCS-CTR(C8.),                           !COMPARE AT TARGET
7396            NEXT,   J/ARITH131A1'                           !
     (4541)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.000]
7397
7398    4520:
7399    ARITH131A1:
7400            P2-T,   D←A-PLUS-B-PLUS-PS[C],                  !ALU=(A-PLUS-B), CIN=PS[C]=(0)
7401                    D[C]←COUT15,                            !GET CARRYOUT
7402                    BUS-A←ASPHI[C125252),                   !A=(125252)
7403                    BUS-B←CSPD(C052525),                    !B=(052525)
```

```
7404                    SR+A-PLUS-B-PLUS-PS[C],                 !D=(177777), COUT15=(0)
7405            NEXT,   J/COMP131A1                             !
    (4520)  DCS[0.00.0.0.0.0]  BM[0001..10.00..11.01..110..110...0.1.1..0..0...0.0111...0..0000.0...11.000...001.100.101]
7406
7407    4145:  !(FREE)
7408    COMP131A1:
7409            PD,     BUMP-VERIFY,                            !COUNT
7410            P2-T,   D+SR-XOR-CSPD(C177777),                 !COMPARE RECEIVED: EXPECTED
7411                    SAVE-D[C],                              !SAVE CARRY
7412            NEXT,   J/GOBUT131A1                            !
    (4145)  DCS[0.00.0.0.0.1]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.0101...0..0000.0...11.000...001.100.110]
7413
7414    4146:  !(FREE)
7415    GOBUT131A1:
7416            SETUP,  RETURN/TEST131A2,                       !RETURN TO START OF NEXT SUBTEST
7417            NEXT,   CALL[DINTOIR-5]                         !GO PUT D -> IR, BUT(INSTR5)
    (4146)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
7418
7419
7420
7421    !CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
7422    4544:
7423    TEST131A2:
7424            PD,     LOAD-EMUA(ZTARGET401),                  !BIT<01> CLEAR
7425                    LOAD-ERROR(TEST131A2),                  !ERROR DIRECTORY KEY
7426                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7427            NEXT,   J/GOBUT131A2                            !
    (4544)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.111]
7428
7429    4147:  !(FREE)
7430    GOBUT131A2:
7431            SETUP,  RETURN/TEST131B1,                       !RETURN TO START OF NEXT SUBTEST
7432            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7433                    J/BUTD[C]B                              !D[C]H= COUT15 H IN BIT<01>
    (4147)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...C11.101.000]
7434
7435
7436
7437    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
7438
7439    !CHECK INTERNAL ALU CARRIES WITH:                (052525)+(125252)+(0)=(177777)
7440    !ALSO CHECK ALU FUNCTION "DIVIDE-STEP" = "A-PLUS-B" SINCE D[C]H=(0)
7441    !FROM ABOVE. D[C]+COUT15=(0)
7442    4546:
7443    TEST131B1:
7444            PD,     LOAD-EMUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTR5 TEST
7445                    LOAD-ERROR(TEST131B1),                  !ERROR DIRECTORY KEY
7446                    DCS-CTR(C8.),                           !COMPARE AT TARGET
7447            NEXT,   J/ARITH131B1                            !
    (4546)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.000]
7448
7449    4150:  !(FREE)
```

```
7450    ARITH131B1:
7451            P2-T,   D←DIVIDE-STEP,                          !ALU=(A-PLUS-B), CIN=(0)
7452                    D[C]←COUT15,                            !GET CARRYOUT
7453                    BUS-A←ASPHI(C052525),                   !A=(052525)
7454                    BUS-B←CSPD(C125252),                    !B=(125252)
7455                    SR←DIVIDE-STEP,                         !D=(177777), COUT15=(0)
7456            NEXT,   J/COMP131B1                             !
    (4150)  DCS[0.00.0.0.0.0]  BM[1000..10.00..11.01..111..110...0.1.1..0..0...0.0110...0..0000.0...11.000...001.101.001]
7457
7458    4151:  !(FREE)
7459    COMP131B1:
7460            P0,     BUMP-VERIFY,                            !COUNT
7461            P2-T,   D←SR-XOR-CSPD(C177777),                 !COMPARE RECEIVED: EXPECTED
7462                    SAVE-D[C],                              !SAVE CARRY
7463            NEXT,   J/GOBUT131B1                            !
    (4151)  DCS[0.00.0.0.0.1]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.0101...0..0000.0...11.000...001.101.010]
7464
7465    4152:  !(FREE)
7466    GOBUT131B1:
7467            SETUP,  RETURN/TEST131B2,                       !RETURN TO START OF NEXT SUBTEST
7468            NEXT,   CALL[DINTOIR-5]                         !GO PUT D -> IR, BUT(INSTRS)
    (4152)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
7469
7470
7471
7472    !CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
7473    4750:
7474    TEST131B2:
7475            P0,     LOAD-ENUA(ZTARGET413),                  !BIT<02> CLEAR
7476                    LOAD-ERROR(TEST131B2),                  !ERROR DIRECTORY KEY
7477                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7478            NEXT,   J/GOBUT131B2                            !
    (4750)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.011]
7479
7480    4153:  !(FREE)
7481    GOBUT131B2:
7482            SETUP,  RETURN/SCOPE131B,                       !RETURN TO SCOPE LOOP TEST WORD
7483            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7484                    J/BUTD[C]C                              !D[C]H= COUT15 H IN BIT<02>
    (4153)  DCS[0.00.0.0.0.0]  BM[0100..00.00..11.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]
7485
7486
7487
7488    4154:  !(FREE)
7489    SCOPE131B:
7490            P3,     CSPD[05]←EMIT, EMIT/170360,             !CONSTANT FOR USE BELOW
7491            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST132A1" (+1. WORDS)
7492                    J/TEST132A1                             !   ERROR:  "ARITH131A1"(-11. WORDS)
    (4154)  DCS[0.00.0.1.0.0]  BM[1111..10.00..00.11..110..000...0.0.0..0..0...0.1010...1..0000.0...11.000...101.010.001]
7493
7494
7495
```

```
7496    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7497
7498    !CHECK INTERNAL ALU CARRIES  WITH:              (125252)-(125252)-(0)=(000000)
7499    !ALSO CHECK ALU FUNCTION "A-MINUS-B", D[C]←COUT15=(1)
7500    !
7501    4521:
7502    TEST132A1:
7503            PO,     LOAD-EMUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTR5 TEST
7504                    LOAD-ERROR(TEST132A1),                  !ERROR DIRECTORY KEY
7505                    DCS-CTR(C7.),                           !COMPARE AT TARGET
7506            NEXT,   J/ARITH132A1                            !
    (4521)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.010]
7507
7508    4522:
7509    ARITH132A1:
7510            P3-T,   D←A-MINUS-B,                            !ALU=(A-MINUS-B-MINUS-1), CIN=(1)
7511                    D[C]←COUT15,                            !GET CARRYOUT
7512                    BUS-A←ASPHI(C125252),                   !A=(125252)
7513                    BUS-B←BSPHI(C125252),                   !B=(125252)
7514                                                            !D=(000000), COUT15=(1)
7515            NEXT,   J/GOBUT132A1                            !
    (4522)  DCS[0.00.0.0.0.0]  BM[1101..01.11..11.01..110..110...1.1.0..0..0...0.0000...0..0000.0...11.000...001.101.101]
7516
7517    4155:  !(FREE)
7518    GOBUT132A1:
7519            PO,     BUMP-VERIFY,                            !COUNT
7520            SETUP,  RETURN/TEST132A2,                       !RETURN TO START OF NEXT SUBTEST
7521            NEXT,   CALL[DINTOIR-5]                         !GO PUT D -> IR, BUT(INSTR5)
    (4155)  DCS[0.00.0.0.0.1]  BM[0100..00.10..10.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
7522
7523
7524
7525    !CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
7526    4516:
7527    TEST132A2:
7528            PO,     LOAD-EMUA(ZTARGET403),                  !BIT<01> SET
7529                    LOAD-ERROR(TEST132A2),                  !ERROR DIRECTORY KEY
7530                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7531            NEXT,   J/GOBUT132A2                            !
    (4516)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.110]
7532
7533    4156:  !(FREE)
7534    GOBUT132A2:
7535            SETUP,  RETURN/TEST132B1,                       !RETURN TO START OF NEXT SUBTEST
7536            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7537                    J/BUTD[C]B                              !D[C]H= COUT15 H IN BIT<01>
    (4156)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]
7538
7539
7540
7541    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7542
```

```
7543    !CHECK INTERNAL ALU CARRIES WITH:                    (052525)-(052525)-(0)=(000000)
7544    !ALSO CHECK ALU FUNCTION "DIVIDE-STEP" = "A-MINUS-B" SINCE D[C]=(1)
7545    !FROM ABOVE. D[C]←COUT15=(1)
7546    4517:
7547    TEST13281:
7548            P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS TEST
7549                    LOAD-ERROR(TEST13281),                  !ERROR DIRECTORY KEY
7550                    DCS-CTR(C7.),                           !COMPARE AT TARGET
7551            NEXT,   J/ARITH13281                            !
    (4517)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.111]
7552
7553    4157:  !(FREE)
7554    ARITH13281:
7555            P3-T,   D←DIVIDE-STEP,                          !ALU=(A-MINUS-B-MINUS-1), CIN=(1)
7556                    D[C]←COUT15,                            !GET CARRYOUT
7557                    BUS-A←ASPHI[C052525),                   !A=(052525)
7558                    BUS-B←BSPHI(C052525),                   !B=(052525)
7559                                                            !D=(000000), COUT15=(1)
7560            NEXT,   J/GOBUT13281                            !
    (4157)  DCS[0.00.0.0.0.0]  BM[1000..01.11..11.01..111..110...1.1.0..0..0...0.0000...0..0000.0...11.000...001.110.000]
7561
7562    4160:  !(FREE)
7563    GOBUT13281:
7564            P0,     BUMP-VERIFY,                            !COUNT
7565            SETUP,  RETURN/TEST13282,                       !RETURN TO START OF NEXT SUBTEST
7566            NEXT,   CALL[DINTOIR-5]                         !GO PUT D -> IR, BUT(INSTRS)
    (4160)  DCS[0.00.0.0.0.1]  BM[0100..00.10..01.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
7567
7568
7569
7570    !CHECK THAT CARRYOUT OF BIT15 (COUT15) WAS CORRECT
7571    4472:
7572    TEST13282:
7573            P0,     LOAD-ENUA(ZTARGET417),                  !BIT<02> SET
7574                    LOAD-ERROR(TEST13282),                  !ERROR DIRECTORY KEY
7575                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7576            NEXT,   J/GOBUT13282                            !
    (4472)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.001]
7577
7578    4161:  !(FREE)
7579    GOBUT13282:
7580            SETUP,  RETURN/SCOPE1328,                       !RETURN TO SCOPE LOOP TEST WORD
7581            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7582                    J/BUTD[C]C                              !D[C]H=COUT15 H IN BIT <02>
    (4161)  DCS[0.00.0.0.0.0]  BM[0100..00.00..11.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]
7583
7584
7585
7586    4162:  !(FREE)
7587    SCOPE1328:
7588            P3,     CSPD[06]←EMIT, EMIT/007417,             !CONSTANT FOR USE BELOW
7589            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST133A1"   (+1. WORDS)
```

```
7590                    J/TEST133A1                             !   ERROR:  "ARITH132A1" (-9. WORDS)
     (4162)  DCS[0.00.0.1.0.0]  BM[0000..10.11..11.00..001..111...0.0.0..0..0...0.1001...1..0000.0...11.000...101.010.011]
7591
7592
7593
7594
7595    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7596
7597    !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH:
7598    !(103607)-PLUS-(103607)-PLUS-(1)=(007417), COUT15=(1)
7599    4523:
7600    TEST133A1:
7601            PO,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
7602                    LOAD-ERROR(TEST133A1),                  !ERROR DIRECTORY KEY
7603                    DCS-CTR(C10.),                          !COMPARE AT TARGET
7604            NEXT,   J/OPB133A1                              !
     (4523)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.000]
7605
7606    4510:
7607    OPB133A1:
7608            P3,     CSPD[16]←EMIT,                          !A,B-SIDE OPERANDS:
7609                    EMIT/103607,                            !"1000 0111 1000 0111"
7610            NEXT,   J/DOPA133A1                             !
     (4510)  DCS[0.00.0.0.0.0]  BM[1000..10.01..11.10..000..111...0.0.0..0..0...0.0001...1..0000.0...11.000...001.110.011]
7611
7612    4163:  !(FREE)
7613    DOPA133A1:
7614            P2-T,   D←CSPD(D16), D[C]←ALU15,                !OP-A INTO D, D[C]←1
7615                    SR←CSPD(D16),                           !OP-A INTO SR TOO
7616            NEXT,   J/GOTEST133A1                           !(OPA=OPB)
     (4163)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.1..0..0...0.0001...0..0000.0...11.000...001.110.100]
7617
7618    4164:  !(FREE)
7619    GOTEST133A1:
7620            PO,     BUMP-VERIFY,                            !COUNT
7621            SETUP,  RETURN/TEST133A2,                       !EXEC SUBR WHICH:
7622                                                            !(1) D←OPA-PLUS-OPB-PLUS-1
7623                                                            !(2) D←007417-XOR-D (EQUAL?)
7624            NEXT,   CALL[ALUCARRY1]                         !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
     (4164)  DCS[0.00.0.0.0.1]  BM[0100..00.10..10.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.111]
7625
7626
7627
7628    !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (1)
7629    4500:
7630    TEST133A2:
7631            PO,     LOAD-ENUA(ZTARGET403),                  !BIT<00>SET
7632                    LOAD-ERROR(TEST133A2),                  !ERROR DIRECTORY KEY
7633                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7634                    BUMP-VERIFY,                            !COUNT
7635            NEXT,   J/GOBUT133A2                            !
     (4500)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.101]
7636
```

```
7637    4165:  !(FREE)
7638    GOBUT133A2:
7639           SETUP,  RETURN/TEST13381,                    !RETURN TO START OF NEXT SUBTEST
7640           NEXT,   GOTO-PAGE(7),                        !BUT TABLE
7641                   J/BUTD[C]A                           !D[C]H = COUT15 IN BIT<00>
    (4165)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
7642
7643
7644
7645
7646
7647    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
7648
7649    !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH COMPLEMENT OF ABOVE:
7650    !(074170)-PLUS-(074170)-PLUS-(0)=(170360), COUT15=(0)
7651    4501:
7652    TEST13381:
7653           P0,     LOAD-ENUA(ZTARGET434),                !SETUP FOR IR=(000000)/BUTINSTR5 COMPARE
7654                   LOAD-ERROR(TEST13381),                !ERROR DIRECTORY KEY
7655                   DCS-CTR(C9.),                         !COMPARE AT TARGET
7656           NEXT,   J/OPA13381                            !
    (4501)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.110]
7657
7658    4166:  !(FREE)
7659    OPA13381:
7660           P2-T,   D←NOT-CSPD(D16),                      !
7661                   D[C]←ALU15,                           !OP-A INTO D, D[C]←0
7662                   SR←NOT-CSPD(D16),                     !OP-A INTO SR TOO
7663                                                         !A-SIDE OPERAND:
7664                                                         !"0111 1000 0111 1000"
7665                                                         !B-SIDE OPERAND WILL BE:
7666           NEXT,   J/GOTEST13381                         !(SAME AS OP-A)
    (4166)  DCS[0.00.0.0.0.0]  BM[0111..10.00..11.01..101..100...0.1.1..0..0...0.0001...0..0000.0...11.000...001.110.111]
7667
7668    4167:  !(FREE)
7669    GOTEST13381:
7670           SETUP,  RETURN/TEST13382,                     !EXEC SUBR WHICH:
7671                                                         !(1) D←(NOT-OPA)-PLUS-(NOT-OPB)
7672                                                         !(2) D←170360-XOR-D (EQUAL?)
7673           NEXT,   CALL[ALUCARRY2]                       !(3) J/BUTINSTR5/(000000) (CHECK ANSWER)
    (4167)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.010.000]
7674
7675
7676
7677    !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (0)
7678    4502:
7679    TEST13382:
7680           P0,     LOAD-ENUA(ZTARGET402),                !BIT<00> CLEAR
7681                   LOAD-ERROR(TEST13382),                !ERROR DIRECTORY KEY
7682           NEXT,   J/GOBUT13382                          !
    (4502)  DCS[1.00.0.0.0.0]  BM[0000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.000]
7683
```

```
7684    4170:  !(FREE)
7685    GOBUT13382:
7686            SETUP,  RETURN/SCOPE133B,                       !RETURN TO SCOPE LOOP TEST WORD
7687            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7688                    J/BUTD[C]A                              !D[C]H = COUT15 H IN BIT<00>
    (4170)  DCS[0.00.0.0.0.0]  BM[0100..00.00..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
7689
7690
7691
7692    4171:  !(FREE)
7693    SCOPE133B:
7694            PO,     BUMP-VERIFY,                            !COUNT
7695            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST134A1" (+1. WORDS)
7696                    J/TEST134A1                             !   ERROR:  "OPA133A1"  (-11. WORDS)
    (4171)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.001]
7697
7698
7699
7700    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7701
7702    !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH:
7703    !(045513)-PLUS-(141703)-PLUS-(1)=(007417), COUT15=(1)
7704    4511:
7705    TEST134A1:
7706            PO,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
7707                    LOAD-ERROR(TEST134A1),                  !ERROR DIRECTORY KEY
7708                    DCS-CTR(C11.),                          !COMPARE AT TARGET
7709            NEXT,   J/OPA134A1                              !
    (4511)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.010]
7710
7711    4512:
7712    OPA134A1:
7713            PO,     BUMP-VERIFY,                            !COUNT
7714            P3,     CSPD[17]←EMIT,                          !A-SIDE OPERAND:
7715                    EMIT/045513,                            !"0100 1011 0100 1011"
7716            NEXT,   J/OPB134A1                              !
    (4512)  DCS[0.00.0.0.0.1]  BM[0100..10.10..11.01..001..011...0.0.0..0..0...0.0000...1..0000.0...11.000...001.111.010]
7717
7718    4172:  !(FREE)
7719    OPB134A1:
7720            P3,     CSPD[16]←EMIT,                          !B-SIDE OPERAND:
7721                    EMIT/141703,                            !"1100 0011 1100 0011"
7722            NEXT,   J/DOPA134A1                             !
    (4172)  DCS[0.00.0.0.0.0]  BM[1100..10.00..11.11..000..011...0.0.0..0..0...0.0001...1..0000.0...11.000...001.111.011]
7723
7724    4173:  !(FREE)
7725    DOPA134A1:
7726            P2-T,   D←CSPD(D17), D[C]←ALU00,                !OP-A INTO D, D[C]←1
7727                    SR←CSPD(D17),                           !OP-A INTO SR TOO
7728            NEXT,   J/GOTEST134A1                           !
    (4173)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..010...0.1.1..0..0...0.0000...0..0000.0...11.000...001.111.100]
7729
7730    4174:  !(FREE)
```

```
7731    GOTEST134A1:
7732            PO,     BUMP-VERIFY,                            !COUNT
7733            SETUP,  RETURN/TEST134A2,                       !EXEC SUBR WHICH:
7734                                                            !(1) D←OPA-PLUS-OPB-PLUS-1
7735                                                            !(2) D←007417-XOR-D (EQUAL?)
7736            NEXT,   CALL[ALUCARRY1]                         !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
    (4174)  DCS[0.00.0.0.0.1]  BM[0100..00.10..10.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.111]
7737
7738
7739
7740    !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (1)
7741    4503:
7742    TEST134A2:
7743            PO,     LOAD-ENUA(ZTARGET403),                  !BIT<01> SET
7744                    LOAD-ERROR(TEST134A2),                  !ERROR DIRECTORY KEY
7745                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7746                    BUMP-VERIFY,                            !COUNT
7747            NEXT,   J/GOBUT134A2                            !
    (4503)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.101]
7748
7749    4175:  !(FREE)
7750    GOBUT134A2:
7751            SETUP,  RETURN/TEST134B1,                       !RETURN TO START OF NEXT SUBTEST
7752            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7753                    J/BUTD[C]B                              !D[C] = COUT15 IN BIT<01>
    (4175)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]
7754
7755
7756
7757
7758
7759    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
7760
7761    !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH COMPLEMENT OF ABOVE:
7762    !(132264)-PLUS-(036074)-PLUS-(0)=(170360), COUT15=(0)
7763    4504:
7764    TEST134B1:
7765            PO,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
7766                    LOAD-ERROR(TEST134B1),                  !ERROR DIRECTORY KEY
7767                    DCS-CTR(C9.),                           !COMPARE AT TARGET
7768            NEXT,   J/OPA134B1                              !
    (4504)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.110]
7769
7770    4176:  !(FREE)
7771    OPA134B1:
7772            P2-T,   D←NOT-CSPD(D17),                        !
7773                    D[C]←ALU00,                             !OP-A INTO D, D[C]←(0)
7774                    SR←NOT-CSPD(D17),                       !OP-A INTO SR TOO
7775                                                            !A-SIDE OPERAND:
7776                                                            !"1011 0100 1011 0100"
7777                                                            !B-SIDE OPERAND WILL BE:
7778            NEXT,   J/GOTEST134B1                           !"0011 1100 0011 1100"
```

```
    (4176)  DCS[0.00.0.0.0.0]  BM[0111..10.00..11.01..101..010...0.1.1..0..0...0.0000...0..0000.0...11.000...001.111.111]
7779
7780    4177:  !(FREE)
7781    GOTEST13481:
7782            SETUP,  RETURN/TEST1348Z,                       !EXEC SUBR WHICH:
7783                                                            !(1) D←(NOT-OPA)-PLUS-(NOT-OPB)
7784                                                            !(2) D←170360-XOR-D (EQUAL?)
7785            NEXT,   CALL[ALUCARRY2]                         !(3) J/BUTINSTR5/(000000) (CHECK ANSWER)
    (4177)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.010.000]
7786
7787
7788
7789    !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (0)
7790    4505:
7791    TEST1348Z:
7792            PO,     LOAD-ENUA(ZTARGET401),                  !BIT<01> CLEAR
7793                    LOAD-ERROR(TEST1348Z),                  !ERROR DIRECTORY KEY
7794                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7795            NEXT,   J/GOBUT1348Z                            !
    (4505)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.000]
7796
7797    4200:  !(FREE)
7798    GOBUT1348Z:
7799            SETUP,  RETURN/SCOPE134B,                       !RETURN TO SCOPE LOOP TEST WORD
7800            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7801                    J/BUTD[C]B                              !D[C]H = COUT15 H IN BIT<01>
    (4200)  DCS[0.00.0.0.0.0]  BM[0100..00.01..00.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]
7802
7803
7804
7805    4201:  !(FREE)
7806    SCOPE134B:
7807            PO,     BUMP-VERIFY,                            !COUNT
7808            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST135A1" (+1. WORDS)
7809                    J/TEST135A1                             !   ERROR:  "OPA134A1" (-11. WORDS)
    (4201)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.011]
7810
7811
7812
7813    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
7814
7815    !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH:
7816    !(122645)-PLUS-(064551)-PLUS-(1)=(007417), COUT15=(1)
7817    4513:
7818    TEST135A1:
7819            PO,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTR5 COMPARE
7820                    LOAD-ERROR(TEST135A1),                  !ERROR DIRECTORY KEY
7821                    DCS-CTR(C11.),                          !COMPARE AT TARGET
7822            NEXT,   J/OPA135A1                              !
    (4513)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.100]
7823
7824    4514:
```

```
7825    OPA135A1:
7826            PD,     BUMP-VERIFY,                            !COUNT
7827            P3,     CSPD[17]←EMIT,                          !A-SIDE OPERAND:
7828                    EMIT/122645,                            !"1010 0101 1010 0101"
7829            NEXT,   J/OPB135A1                              !
    (4514)  DCS[0.00.0.0.0.1]  BM[1010..10.01..01.10..100..101...0.0.0..0..0...0.0000...1..0000.0...11.000...010.000.010]
7830
7831    4202:  !(FREE)
7832    OPB135A1:
7833            P3,     CSPD[16]←EMIT,                          !B-SIDE OPERAND:
7834                    EMIT/064551,                            !"0110 1001 0110 1001"
7835            NEXT,   J/DOPA135A1                             !
    (4202)  DCS[0.00.0.0.0.0]  BM[0110..10.10..01.01..101..001...0.0.0..0..0...0.0001...1..0000.0...11.000...010.000.011]
7836
7837    4203:  !(FREE)
7838    DOPA135A1:
7839            P2-T,   D←CSPD(D17), D[C]←ALU15,                !OP-A INTO D, D[C]←1
7840                    SR←CSPD(D17),                           !OP-A INTO SR TOO
7841            NEXT,   J/GOTEST135A1                           !
    (4203)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.1..0..0...0.0000...0..0000.0...11.000...010.000.100]
7842
7843    4204:  !(FREE)
7844    GOTEST135A1:
7845            PD,     BUMP-VERIFY,                            !COUNT
7846            SETUP,  RETURN/TEST135A2,                       !EXEC SUBR WHICH:
7847                                                            !(1) D←OPA-PLUS-OPB-PLUS-1
7848                                                            !(2) D←007417-XOR-D (EQUAL?)
7849            NEXT,   CALL[ALUCARRY1]                         !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
    (4204)  DCS[0.00.0.0.0.1]  BM[0100..00.10..10.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.111]
7850
7851
7852
7853    !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (1)
7854    4506:
7855    TEST135A2:
7856            PD,     LOAD-ENUA(ZTARGET417),                  !BIT<02> SET
7857                    LOAD-ERROR(TEST135A2),                  !ERROR DIRECTORY KEY
7858                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7859                    BUMP-VERIFY,                            !COUNT
7860            NEXT,   J/GOBUT135A2                            !
    (4506)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.101]
7861
7862    4205:  !(FREE)
7863    GOBUT135A2:
7864            SETUP,  RETURN/TEST135B1,                       !RETURN TO START OF NEXT SUBTEST
7865            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7866                    J/BUTD[C]C                              !D[C]H = COUT15 IN BIT<02>
    (4205)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]
7867
7868
7869
7870
```

```
7871
7872    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7873
7874    !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH COMPLEMENT OF ABOVE:
7875    !(055132)-PLUS-(113226)-PLUS-(0)=(170360), COUT15=(0)
7876    4507:
7877    TEST135B1:
7878            PO,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
7879                    LOAD-ERROR(TEST135B1),                  !ERROR DIRECTORY KEY
7880                    DCS-CTR(C9.),                           !COMPARE AT TARGET
7881            NEXT,   J/OPA135B1                              !
    (4507)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.110]
7882
7883    4206:  !(FREE)
7884    OPA135B1:
7885            P2-T,   D←NOT-CSPD(D17),                        !
7886                    D[C]←ALU15,                             !OP-A INTO D, D[C]←(0)
7887                    SR←NOT-CSPD(D17),                       !OP-A INTO SR TOO
7888                                                            !A-SIDE OPERAND:
7889                                                            !"0101 1010 0101 1010"
7890                                                            !B-SIDE OPERAND WILL BE:
7891            NEXT,   J/GOTEST135B1                           !"1001 0110 1001 0110"
    (4206)  DCS[0.00.0.0.0.0]  BM[0111..10.00..11.01..101..100...0.1.1..0..0...0.0000...0..0000.0...11.000...010.000.111]
7892
7893    4207:  !(FREE)
7894    GOTEST135B1:
7895            SETUP,  RETURN/TEST135B2,                       !EXEC SUBR WHICH:
7896                                                            !(1) D←(NOT-OPA)-PLUS-(NOT-OPB)
7897                                                            !(2) D←170360-XOR-D (EQUAL?)
7898            NEXT,   CALL[ALUCARRY2]                         !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
    (4207)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.010.000]
7899
7900
7901
7902    !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (0)
7903    4477:
7904    TEST135B2:
7905            PO,     LOAD-ENUA(ZTARGET413),                  !BIT<02> CLEAR
7906                    LOAD-ERROR(TEST135B2),                  !ERROR DIRECTORY KEY
7907                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7908            NEXT,   J/GOBUT135B2                            !
    (4477)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.000]
7909
7910    4210:  !(FREE)
7911    GOBUT135B2:
7912            SETUP,  RETURN/SCOPE135B,                       !RETURN TO SCOPE LOOP TEST WORD
7913            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
7914                    J/BUTD[C]C                              !D[C]H = COUT15 H IN BIT<02>
    (4210)  DCS[0.00.0.0.0.0]  BM[0100..00.01..00.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]
7915
7916
7917
```

```
7918    4211:  !(FREE)
7919    SCOPE135B:
7920            P0,     BUMP-VERIFY,                            !COUNT
7921            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST136A1" (+1. WORDS)
7922                    J/TEST136A1                             !   ERROR:  "OPA135A1"  (-11. WORDS)
    (4211)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.101]
7923
7924
7925
7926    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7927
7928    !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH:
7929    !(055132)-PLUS-(132264)-PLUS-(1)=(007417), COUT15=(1)
7930    4515:
7931    TEST136A1:
7932            P0,     LOAD-EMUA(ZTARGET434),                  !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
7933                    LOAD-ERROR(TEST136A1),                  !ERROR DIRECTORY KEY
7934                    DCS-CTR(C10.),                          !COMPARE AT TARGET
7935            NEXT,   J/OPB136A1                              !
    (4515)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.010]
7936
7937    4542:
7938    OPB136A1:
7939            P3,     CSPD[16]←EMIT,                          !B-SIDE OPERAND:
7940                    EMIT/132264,                            !"1011 0100 1011 0100"
7941            NEXT,   J/DOPA136A1                             !
    (4542)  DCS[0.00.0.0.0.0]  BM[1011..10.01..00.10..110..100...0.0.0..0..0...0.0001...1..0000.0...11.000...010.001.010]
7942
7943    4212:  !(FREE)
7944    DOPA136A1:
7945            P2-T,   D←NOT-CSPD(D17), D[C]←COUT07,           !OP-A INTO D, D[C]←1
7946                    SR←NOT-CSPD(D17),                       !OP-A INTO SR TOO
7947            NEXT,   J/GOTEST136A1                           !"0101 1010 0101 1010"
    (4212)  DCS[0.00.0.0.0.0]  BM[0111..10.00..11.01..101..101...0.1.1..0..0...0.0000...0..0000.0...11.000...010.001.011]
7948
7949    4213:  !(FREE)
7950    GOTEST136A1:
7951            P0,     BUMP-VERIFY,                            !COUNT
7952            SETUP,  RETURN/TEST136A2,                       !EXEC SUBR WHICH:
7953                                                            !(1) D←OPA-PLUS-OPB-PLUS-1
7954                                                            !(2) D←007417-XOR-D EQUAL?)
7955            NEXT,   CALL[ALUCARRY1]                         !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
    (4213)  DCS[0.00.0.0.0.1]  BM[0100..00.10..01.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.111]
7956
7957
7958
7959    !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (1)
7960    4476:
7961    TEST136A2:
7962            P0,     LOAD-EMUA(ZTARGET403),                  !BIT<00> SET
7963                    LOAD-ERROR(TEST136A2),                  !ERROR DIRECTORY KEY
7964                    DCS-CTR(C3.),                           !COMPARE AT TARGET
7965                    BUMP-VERIFY,                            !COUNT
```

```
7966                    NEXT,   J/GOBUT136A2                                    !
     (4476)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.100]
7967
7968      4214:  !(FREE)
7969      GOBUT136A2:
7970                    SETUP,  RETURN/TEST136B1,                               !RETURN TO START OF NEXT SUBTEST
7971                    NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
7972                            J/BUTD[C]A                                      !D[C]H = COUT15 IN BIT<00>
     (4214)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
7973
7974
7975
7976
7977
7978      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7979
7980      !CHECK CARRY PROPOGATE/GENERATE LOGIC WITH COMPLEMENT OF ABOVE:
7981      !(122645)-PLUS-(132264)-PLUS-(0)=(170360), COUT15=(0)
7982      4475:
7983      TEST136B1:
7984                    P0,     LOAD-ENUA(ZTARGET434),                          !SETUP FOR IR=(000000)/BUTINSTRS COMPARE
7985                            LOAD-ERROR(TEST136B1),                          !ERROR DIRECTORY KEY
7986                            DCS-CTR(C9.),                                   !COMPARE AT TARGET
7987                    NEXT,   J/OPA136B1                                      !
     (4475)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.101]
7988
7989      4215:  !(FREE)
7990      OPA136B1:
7991                    P2-T,   D←CSPD(D17),                                    !
7992                            D[C]←0,                                         !OP-A INTO D, D[C]←0
7993                            SR←CSPD(D17),                                   !OP-A INTO SR TOO
7994                                                                            !A-SIDE OPERAND:
7995                                                                            !"1010 0101 1010 0101"
7996                                                                            !B-SIDE OPERAND WILL BE:
7997                    NEXT,   J/GOTEST136B1                                   !"0100 1011 0100 1011"
     (4215)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.1..0..0...0.0000...0..0000.0...11.000...010.001.110]
7998
7999      4216:  !(FREE)
8000      GOTEST136B1:
8001                    SETUP,  RETURN/TEST136B2,                               !EXEC SUBR WHICH:
8002                                                                            !(1) D←(NOT-OPA)-PLUS-(NOT-OPB)
8003                                                                            !(2) D←170360-XOR-D (EQUAL?)
8004                    NEXT,   CALL[ALUCARRY2]                                 !(3) J/BUTINSTRS/(000000) (CHECK ANSWER)
     (4216)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.010.000]
8005
8006
8007
8008      !CHECK THAT CARRYOUT COUT15 ABOVE GENERATED CORRECTLY AS A (0)
8009      4473:
8010      TEST136B2:
8011                    P0,     LOAD-ENUA(ZTARGET402),                          !BIT<00> CLEAR
8012                            LOAD-ERROR(TEST136B2),                          !ERROR DIRECTORY KEY
```

```
8013                    DCS-CTR(C3.),                                   !COMPARE AT TARGET
8014            NEXT,   J/GOBUT13682                                    !
    (4473)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.111]
8015
8016    4217:  !(FREE)
8017    GOBUT13682:
8018            SETUP,  RETURN/SCOPE136B,                               !RETURN TO SCOPE LOOP TEST WORD
8019            NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
8020                    J/BUTD[C]A                                      !D[C]H = COUT15 H IN BIT<00>
    (4217)  DCS[0.00.0.0.0.0]  BM[0100..00.01..00.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
8021
8022
8023
8024    4220:  !(FREE)
8025    SCOPE136B:
8026            P0,     BUMP-VERIFY,                                    !COUNT
8027            NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "TEST320A"  (+1. WORDS)
8028                    J/TEST320A                                      !   ERROR:  "OPA136A1" (-11. WORDS)
    (4220)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.011]
8029
8030
8031
8032
8033
8034
8035    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8036
8037    !       THE FOLLOWING TWO SUBROUTINES ARE USED IN THE ABOVE CARRY LOOKAHEAD/INTERNAL CARRIES TESTS:
8038
8039
8040    7007:  !(FREE)
8041    ALUCARRY1:
8042            P3-T,   D←A-PLUS-B-PLUS-D[C],                           !D <- SUM OF A, B;  D[C] WAS SET PREVIOUSLY
8043                    D[C]←COUT15,                                    !GET CARRYOUT FOR EXAMINATION LATER
8044                    SR←A-PLUS-B-PLUS-D[C],                          !ALSO GET IT INTO THE SR
8045                    BUS-A←SR,                                       !A-SIDE OPERAND WAS IN THE SR
8046                    BUS-B←CSPD(D16),                                !B-SIDE OPERAND WAS IN CSP(16)
8047            NEXT,   J/ALUCARRY1A                                    !
    (7007)  DCS[0.00.0.0.0.0]  BM[0100..10.00..00.00..000..110...1.1.1..0..0...0.0001...0..0000.0...11.000...000.001.111]
8048
8049    7017:  !(FREE)
8050    ALUCARRY1A:
8051            P2-T,   D←SR-XOR-CSPD(D06), SAVE-D[C],                  !COMPARE RECEIVED : (007417)
8052            NEXT,   J/DINTOIR5                                      !GO PUT D -> IR, BUT(INSTR5) FOR (000000)
    (7017)  DCS[0.00.0.0.0.0]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.1001...0..0000.0...11.000...010.111.011]
8053
8054
8055
8056
8057    7020:  !(FREE)
8058    ALUCARRY2:
8059            P3-T,   D←A-PLUS-NOT-B-PLUS-D[C],                       !D <- DIFF OF A, B;  D[C] WAS SET PREVIOUSLY
8060                    D[C]←COUT15,                                    !GET CARRYOUT FOR EXAMINATION LATER
```

```
8061                    SR←A-PLUS-NOT-B-PLUS-D[C],              !ALSO GET IT INTO THE SR
8062                    BUS-A←SR,                               !A-SIDE OPERAND WAS IN THE SR
8063                    BUS-B←CSPD(D16),                        !B-SIDE OPERAND WAS IN CSP(16)
8064            NEXT,   J/ALUCARRY2A                            !
    (7020)  DCS[0.00.0.0.0.0]  BM[0101..10.00..00.00..000..110...1.1.1..0..0...0.0001...0..0000.0...11.000...000.010.001]
8065
8066    7021:  !(FREE)
8067    ALUCARRY2A:
8068            P2-T,   D←SR-XOR-CSPD(D05), SAVE-D[C],          !COMPARE RECEIVED : (170360)
8069            NEXT,   J/DINTOIRS                              !GO PUT D -> IR, BUT(INSTRS) FOR (000000)
    (7021)  DCS[0.00.0.0.0.0]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.1010...0..0000.0...11.000...010.111.011]
8070
8071
8072
8073
8074
8075    !.PAGE=============================================================================================================
8076
8077
8078    .TOC    *    TEST320:  D[C] SELECTION / COUT07-DOUT07 / D<14:00>=ZERO@BIT<00>
8079
8080
8081    !*************************************************************************************************
8082    !*
8083    !*      TESTS:  320 A - F                                   UWORDS:  026 + 014
8084    !*
8085    !*      FUNCTIONS:
8086    !*
8087    !*      THESE SIX TESTS CHECK THE D[C] ADDRESS SELECTION LOGIC, COUT07 CARRY
8088    !*      AND DOUT07 BUTS, AND THE D<14:00>=ZERO BUT, WHEN ONLY BIT<00>=1 (NOT
8089    !*      CHECKED IN TEST410).
8090    !*
8091    !*************************************************************************************************
8092
8093
8094
8095    !TEST-320-A SETS ONLY THE D[C] INPUT "ALU00" (CODE=010), AND THEN CHECKS THAT D[C]←ALU00
8096    !  RESULTS IN A "1".
8097    4543:
8098    TEST320A:
8099            P0,     LOAD-ENUA(ZTARGET403),                  !BIT<00> SET
8100                    LOAD-ERROR(TEST320A),                   !ERROR DIRECTORY KEY
8101                    DCS-CTR(C6.),                           !COMPARE AT TARGET
8102            NEXT,   J/SETONE320A                            !
    (4543)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.000]
8103
8104    4700:
8105    SETONE320A:
8106            P0,     BUMP-VERIFY,                            !COUNT
8107            P3,     CSPD[17]←EMIT, EMIT/000001,             !A ONE
8108            NEXT,   J/SETD320A                              !
    (4700)  DCS[0.00.0.0.0.1]  BM[0000..10.00..00.00..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...010.010.001]
8109
8110    4221:  !(FREE)
```

```
8111    SETD320A:
8112            P2-T,   D←CSPD(D17), D[C]←0,                    !D GETS (000001)
8113                    SR←CSPD(D17),                           !SO DOES SR
8114            P3,     A#BSPHI[11]←0,                          !STORE THE CONSTANT
8115            NEXT,   J/GETDC320A                             !
    (4221)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..000..000...0.1.1..0..0...0.0000...0..1011.0...11.000...010.010.010]
8116
8117    4222:  !(FREE)
8118    GETDC320A:
8119            P2-T,   D←A-PLUS-B-PLUS-0, D[C]←ALU00,          !D[C] CODE (010)
8120                    BUS-A←SR,                               !A=(000001)
8121                    BUS-B←CSPD(C000000),                    !B=(000000)
8122            NEXT,   J/GOBUT320A                             !D=(000001), ONLY D[C]=ALU00 SET
    (4222)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.00..000..010...0.1.0..0..0...0.0100...0..0000.0...11.000...010.010.011]
8123
8124    4223:  !(FREE)
8125    GOBUT320A:
8126            P0,     BUMP-VERIFY,                            !COUNT
8127            SETUP,  RETURN/TEST320B,                        !RETURN TO START OF NEXT SUBTEST
8128            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
8129                    J/BUTD[C]A                              !D[C]H IN BIT<00>
    (4223)  DCS[0.00.0.0.0.1]  BM[0100..00.10..11.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.100]
8130
8131
8132
8133
8134    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8135
8136    !TEST-320-B CHECKS THAT D<14:00>=ZERO IS NOT SET WHEN D=(000001)
8137    4552:
8138    TEST320B:
8139            P0,     LOAD-ENUA(ZTARGET400),                  !BIT<01> CLEAR
8140                    LOAD-ERROR(TEST320B),                   !ERROR DIRECTORY KEY
8141                    DCS-CTR(C3.),                           !COMPARE AT TARGET
8142                    BUMP-VERIFY,                            !COUNT
8143            NEXT,   J/GOBUT320B                             !
    (4552)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...010.010.100]
8144
8145    4224:  !(FREE)
8146    GOBUT320B:
8147            SETUP,  RETURN/TEST320C,                        !RETURN TO START OF NEXT SUBTEST
8148            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
8149                    J/BUTD-IS-ZERO                          !CHEK ON IT
    (4224)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
8150
8151
8152
8153    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8154
8155    !TEST-320-C CHECKS THAT THE COUT15/COUT07 SIGNALS DON'T TRACK EACH OTHER
8156    4562:
8157    TEST320C:
```

```
8158            P0,     LOAD-ENUA(ZTARGET413),                  !BIT<02> CLEAR
8159                    LOAD-ERROR(TEST320C),                   !ERROR DIRECTORY KEY
8160                    DCS-CTR(C6.),                           !COMPARE AT TARGET
8161            NEXT,   J/SETONE320C                            !
    (4562)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.010.101]
8162
8163    4225:  !(FREE)
8164    SETONE320C:
8165            P3,     CSPD[16]←EMIT, EMIT/100000,             !A ONE IN B15
8166            NEXT,   J/SETD320C                              !
    (4225)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...010.010.110]
8167
8168    4226:  !(FREE)
8169    SETD320C:
8170            P2-T,   D←CSPD(D16), D[C]←ALU15,                !D GETS (100000)
8171                    SR←CSPD(D16),                           !SO DOES SR
8172            P3,     A#BSPHI[13]←D,                          !STORE THE CONSTANT
8173            NEXT,   J/GETDC320C                             !
    (4226)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..001..100...0.1.1..0..0...0.0001...0..1011.0...11.000...010.010.111]
8174
8175    4227:  !(FREE)
8176    GETDC320C:
8177            P0,     BUMP-VERIFY,                            !COUNT
8178            P2-T,   D←A-PLUS-B-PLUS-0, D[C]←COUT07,         !D[C] GETS COUT07=0, COUT15=1
8179                    BUS-A←SR,                               !A=(100000)
8180                    BUS-B←CSPD(C125252),                    !B=(125252)
8181            NEXT,   J/GOBUT320C                             !D=(025252)
    (4227)  DCS[0.00.0.0.0.1]  BM[1001..10.00..00.00..000..101...0.1.0..0..0...0.0110...0..0000.0...11.000...010.011.000]
8182
8183    4230:  !(FREE)
8184    GOBUT320C:
8185            SETUP,  RETURN/TEST320D,                        !RETURN TO START OF NEXT SUBTEST
8186            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
8187                    J/BUTD[C]C                              !D[C]H IN BIT<02>
    (4230)  DCS[0.00.0.0.0.0]  BM[0100..00.10..10.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.000]
8188
8189
8190
8191
8192
8193    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
8194
8195    !TEST-320-D CHECKS THAT THE BUTR(COUT07#DOUT07) SEES THE (01*) THAT WAS GENERATED
8196    4537:
8197    TEST320D:
8198            P0,     LOAD-ENUA(ZTARGET403),                  !BIT<2:1> = "01"
8199                    LOAD-ERROR(TEST320D),                   !ERROR DIRECTORY KEY
8200                    DCS-CTR(C3.),                           !COMPARE AT TARGET
8201            NEXT,   J/GOBUT320D                             !
    (4537)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.001]
8202
8203    4231:  !(FREE)
8204    GOBUT320D:
```

```
8205            SETUP,  RETURN/TEST320E,                        !RETURN TO START OF NEXT SUBTEST
8206            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
8207                    J/BUTCOUT7DOUT7                         !COUT07#D07 IN BIT<2:1>
    (4231)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.001]
8208
8209
8210
8211
8212    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8213
8214    !TEST-320-E SETS ONLY THE D[C] INPUT "COUT07" (CODE=101), AND THEN CHECKS THAT D[C]←COUT07
8215    !  RESULTS IN A "1".
8216    4554:
8217    TEST320E:
8218            P0,     LOAD-ENUA(ZTARGET403),                  !BIT<01> SET
8219                    LOAD-ERROR(TEST320E),                   !ERROR DIRECTORY KEY
8220                    DCS-CTR(C6.),                           !COMPARE AT TARGET
8221            NEXT,   J/SETONE320E                            !
    (4554)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.010]
8222
8223    4232:  !(FREE)
8224    SETONE320E:
8225            P0,     BUMP-VERIFY,                            !COUNT
8226            P3,     CSPD[15]←EMIT, EMIT/000200,             !A ONE IN BIT07
8227            NEXT,   J/SETD320E                              !
    (4232)  DCS[0.00.0.0.0.1]  BM[0000..10.00..00.10..000..000...0.0.0..0..0...0.0010...1..0000.0...11.000...010.011.011]
8228
8229    4233:  !(FREE)
8230    SETD320E:
8231            P2-T,   D←CSPD(D15), D[C]←0,                    !D GETS (000200)
8232                    SR←CSPD(D15),                           !SO DOES SR
8233            P3,     A#BSPHI[15]←D,                          !STORE THE CONSTANT
8234            NEXT,   J/GETDC320E                             !
    (4233)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..010..000...0.1.1..0..0...0.0010...0..1011.0...11.000...010.011.100]
8235
8236    4234:  !(FREE)
8237    GETDC320E:
8238            P2-T,   D←A-PLUS-B-PLUS-0, D[C]←COUT07,         !D[C] CODE (101)
8239                    BUS-A←SR,                               !A=(000200)
8240                    BUS-B←CSPD(D15),                        !B=(000200)
8241            NEXT,   J/GOBUT320E                             !D=(000400), ONLY D[C]=COUT07 SET
    (4234)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.00..000..101...0.1.0..0..0...0.0010...0..0000.0...11.000...010.011.101]
8242
8243    4235:  !(FREE)
8244    GOBUT320E:
8245            SETUP,  RETURN/TEST320F,                        !RETURN TO START OF NEXT SUBTEST
8246            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
8247                    J/BUTD[C]B                              !D[C]H IN BIT<01>
    (4235)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.000]
8248
8249
8250
```

```
8251
8252    ! - - -
```

```
8301    !LOCATIONS (00:07) OF ASPHI, ASPLO, BSPHI, BSPLO, THRU USE OF A COUNT LOOP.
8302    !THE GENERATED PATTERN IS THEN READ BACK, AND COMPARED TO A REGENERATED ORIGINAL,
8303    !TO CHECK FOR ADDRESSING CORRECTNESS, ABILITY TO READ/WRITE, AND DATAPATH VALIDITY.
8304    !
8305    !FIRST FILL UP THE SCRATCHPADS:
8306    !
8307    !       AT THE END OF THE FILLUP LOOP, A/B SP HI/LO LOOK LIKE THIS:
8308    !
8309    !       LOCTN   ASPHI           BSPHI           ASPLO           BSPLO
8310    !       -----   ------          ------          ------          ------
8311    !
8312    !         00    050700          050700          057077          057077
8313    !         01    051611          051611          056166          056166
8314    !         02    052522          052522          055255          055255
8315    !         03    053433          053433          054344          054344
8316    !         04    054344          054344          053433          053433
8317    !         05    055255          055255          052522          052522
8318    !         06    056166          056166          051611          051611
8319    !         07    057077          057077          050700          050700
8320    !         10    ------          ------          ------          ------
8321    !         11    000001          000001          ------          ------
8322    !         12    000152          000152          ------          ------
8323    !         13    100000          100000          000125          000125
8324    !         14    ------          ------          ------          ------
8325    !         15    000200          000200          ------          ------
8326    !         16    ------          ------          ------          ------
8327    !         17    ------          ------          ------          ------
8328    !
8329    !       NOTE:  CONSTANTS FOR DCS IN ASPHI/BSPHI 01/03/05/07 WERE DESTROYED,
8330    !               AND *MUST* BE RESTORED AFTER LEAVING THIS TEST SEQUENCE.
8331    !
8332    !
8333    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8334
8335
8336    4701:
8337    TEST350:
8338            P0,     LOAD-ERROR(TEST350),                    !ERROR DIRECTORY KEY
8339            P3,     CSPD[15]←EMIT, EMIT/177067,             !ADDED TO PATTERN "N" TO GET "N+1"
8340            NEXT,   J/START350                              !
    (4701)  DCS[1.00.0.0.0.0]  BM[1111..10.11..10.00..110..111...0.0.0..0..0...0.0010...1..0000.0...11.000...010.100.000]
8341
8342    4240:  !(FREE)
8343    START350:
8344            P0,     BUMP-VERIFY,                            !COUNT
8345            P3,     CSPD[14]←EMIT, EMIT/057077,             !THE INITIAL PATTERN
8346                                                            !SF=0, DM=7, DF=7
8347            NEXT,   J/LOADSRD350                            !
    (4240)  DCS[0.00.0.0.0.1]  BM[0101..10.11..10.00..111..111...0.0.0..0..0...0.0011...1..0000.0...11.000...010.100.001]
8348
8349    4241:  !(FREE)
8350    LOADSRD350:
8351            P2-T,   D←CSPD(D14),                            !INITIAL PATTERN
8352                    SR←CSPD(D14),                           !D->IR, SR-TEMP
```

```
8353            NEXT,   GOTO-PAGE(7),                                   !
8354                    J/DINTOIR350                                    !
     (4241)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..111...0.1.1..0..0...0.0011...0..0000.0...11.100...011.101.011]
8355
8356    !*** LOOP BACK POINT FOR SP FILLUP ***
8357
8358    7353:
8359    DINTOIR350:
8360            SETUP,  RETURN/WRITEDF350,                              !CALL SUBR FOR D -> IR
8361            NEXT,   CALL[DINTOIR]                                   !
     (7353)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.111]
8362
8363    4002:  !(FREE)
8364    WRITEDF350:
8365            PO,     DCS-CTR(C15.),                                  !HOLD UP
8366            P3,     A#BSPHI[DF]←D,                                  !USE DF TO WRITE A/B HI, W/ WR(AB,H,A)
8367            NEXT,   GOTO-PAGE(7),                                   !
8368                    J/WRITESF350                                    !
     (4002)  DCS[0.00.1.0.0.0]  BM[0000..00.00..00.10..000..111...0.0.0..0..0...0.0000...0..1011.0...11.100...000.001.110]
8369
8370    7016:  !(FREE)
8371    WRITESF350:
8372            P3,     A#BSPLO[SF]←D,                                  !USE SF TO WRITE A/B LO, W/ WR(AB,L,B)
8373            NEXT,   J/NEXTPAT350                                    !
     (7016)  DCS[0.00.0.0.0.0]  BM[0000..00.01..00.11..000..000...0.0.0..0..0...0.0000...0..0011.0...11.000...000.010.011]
8374
8375    7023:  !(FREE)
8376    NEXTPAT350:
8377            P2-T,   SR#D+SR-PLUS-CSPD(D15), SAVE-D[C],              !INCREMENT PATTERN
8378            NEXT,   BUTR(DMD),                                      !IF TRUE:  "LOADHI350" (+1. WORDS) EXIT LOOP
8379                    J/DINTOIR350                                    !IF FALSE: "DINTOIR350" (-3. WORDS) KEEP GOING
     (7023)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.00..000..111...0.1.1..0..0...0.0010...0..0000.0...01.001...011.101.011]
8380
8381
8382    !COME HERE IF DONE LOOPING
8383    7357:
8384    LOADHI350:
8385                                                                    !*** IF ANY ASP/BSP HI/LO BIT<03> IN ADDR STUCK ZERO,
8386                                                                    !       ONE OF THE FOLLOWING TWO WORDS WILL OVERWRITE
8387                                                                    !       A PREVIOUSLY WRITTEN LOCATION (IE, 02 OR 03) ***
8388            P2-T,   D+CSPD(D01), SAVE-D[C],                         !PATTERN OF (000152)
8389            P3,     A#BSPHI[12]←D,                                  !WRITE SPHI WITH ADDRS BIT<03> SET, DF=0, W/ WR(AB,H,A)
8390            NEXT,   J/LOADHIA350                                    !  FOR USE IN TEST373
     (7357)  DCS[0.00.0.0.0.0]  BM[1010..10.10..00.00..001..111...0.1.0..0..0...0.1110...0..1011.0...11.000...000.010.100]
8391
8392    7024:  !(FREE)
8393    LOADHIA350:
8394            P2-T,   D+CSPD(D02), SAVE-D[C],                         !PATTERN OF (000125)
8395            P3,     A#BSPLO[13]←D,                                  !WRITE SPHI WITH ADDRS BIT<03> SET, DF=0, W/ WR(AB,L,B)
8396            NEXT,   J/AGAINSRD350                                   !
     (7024)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..001..111...0.1.0..0..0...0.1101...0..0011.0...11.000...000.010.101]
8397
```

```
8398    7025:  !(FREE)
8399    AGAINSRD350:
8400            P2-T,   D←CSPD(D14),                    !AGAIN RESET D, SR TO INITIAL PATTERN
8401                    SR←CSPD(D14),                   !OF (057077)
8402            NEXT,   GOTO-PAGE(4),                   !
8403                    J/DINTOIRA350                   !
    (7025)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.1..0..0...0.0011...0..0000.0...11.100...101.110.011]
8404
8405    !*** LOOP BACK ENTRY POINT FOR TESTS ***
8406
8407    4563:
8408    DINTOIRA350:
8409            SETUP,  RETURN/TEST350A,                !GO TO SUBR WHICH PUTS SR -> IR FOR SF/DF/DM
8410            NEXT,   CALL[SRINTOIR]                  !
    (4563)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.110]
8411
8412
8413    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8414
8415    !TEST 350A CHECKS BSP-ADDRS/SF, BSPLO ADDRS FOR ERRORS
8416    4752:
8417    TEST350A:
8418            P0,     LOAD-ENUA(ZTARGET434),          !INSTRS FOR IR=(000000)
8419                    LOAD-ERROR(TEST350A),           !ERROR DIRECTORY KEY
8420                    DCS-CTR(C7.),                   !COMPARE AT TARGET
8421            NEXT,   J/COMP350A                      !
    (4752)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.010]
8422
8423    4702:
8424    COMP350A:
8425            P2-T,   D←SR-XOR-BSPLO[SF], SAVE-D[C],  !COMPARE EXPECTED:RECEIVED, BITWISE
8426            NEXT,   J/GOBUT350A                     !
    (4702)  DCS[0.00.0.0.0.0]  BM[0110..00.01..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.100.011]
8427
8428    4243:  !(FREE)
8429    GOBUT350A:
8430            P0,     BUMP-VERIFY,                    !COUNT
8431            SETUP,  RETURN/RESETIR350A,             !GO TO SUBR WHICH:
8432            NEXT,   CALL[DINTOIR-5]                 !  D -> IR, BUT(INSTRS)
    (4243)  DCS[0.00.0.0.0.1]  BM[0111..00.00..00.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8433
8434    7022:  !(FREE)
8435    RESETIR350A:
8436            SETUP,  RETURN/TEST350B,                !GO TO SUBR WHICH PUTS SR -> IR FOR SF/DF/DM
8437            NEXT,   CALL[SRINTOIR]                  !
    (7022)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.110]
8438
8439
8440    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8441
8442    !TEST 350B CHECKS BSP-ADDRS/DF, BSPHI ADDRS FOR ERRORS
```

```
8443    4753:
8444    TEST350B:
8445            P0,     LOAD-ENUA(ZTARGET434),                  !INSTR5 FOR IR=(000000)
8446                    LOAD-ERROR(TEST350B),                   !ERROR DIRECTORY KEY
8447                    DCS-CTR(C7.),                           !COMPARE AT TARGET
8448            NEXT,   J/COMP350B                              !
    (4753)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.100.100]
8449
8450    4244:  !(FREE)
8451    COMP350B:
8452            P2-T,   D+SR-XOR-BSPHI[DF], SAVE-D[C],          !COMPARE EXPECTED:RECEIVED, BITWISE
8453            NEXT,   J/GOBUT350B                             !
    (4244)  DCS[0.00.0.0.0.0]  BM[0110..01.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.100.101]
8454
8455    4245:  !(FREE)
8456    GOBUT350B:
8457            SETUP,  RETURN/RESETIR350B,                     !GO TO SUBR WHICH:
8458            NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTR5)
    (4245)  DCS[0.00.0.0.0.0]  BM[0111..00.00..00.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8459
8460    7026:  !(FREE)
8461    RESETIR350B:
8462            SETUP,  RETURN/TEST350C,                        !GO TO SUBR WHICH PUTS SR -> IR FOR SF/DF/DM
8463            NEXT,   CALL[SRINTOIR]                          !
    (7026)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.110]
8464
8465
8466
8467    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8468
8469    !TEST 350C CHECKS ASP-ADDRS/DF, ASPLO ADDRS FOR ERRORS
8470    4742:
8471    TEST350C:
8472            P0,     LOAD-ENUA(ZTARGET434),                  !INSTR5 FOR IR=(000000)
8473                    LOAD-ERROR(TEST350C),                   !ERROR DIRECTORY KEY
8474                    DCS-CTR(C7.),                           !COMPARE AT TARGET
8475                    BUMP-VERIFY,                            !COUNT
8476            NEXT,   J/COMP350C                              !
    (4742)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.100.110]
8477
8478    4246:  !(FREE)
8479    COMP350C:
8480            P2-T,   D+ASPLO[DF]-XOR-BSPHI[SF], SAVE-D[C],   !COMPARE RECEIVED:EXPECTED, BITWISE
8481            NEXT,   J/GOBUT350C                             !
    (4246)  DCS[0.00.0.0.0.0]  BM[0110..01.01..10.10..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.100.111]
8482
8483    4247:  !(FREE)
8484    GOBUT350C:
8485            SETUP,  RETURN/RESETIR350C,                     !GO TO SUBR WHICH:
8486            NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTR5)
    (4247)  DCS[0.00.0.0.0.0]  BM[0111..00.00..00.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8487
```

```
8488    7027:  !(FREE)
8489    RESETIR350C:
8490            SETUP,  RETURN/TEST350D,                        !GO TO SUBR WHICH PUTS SR -> IR FOR SF/DF/DM
8491            NEXT,   CALL[SRINTOIR]                          !
     (7027)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.110]
8492
8493
8494
8495    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8496
8497    !TEST 350D CHECKS ASP-ADDRS/SF, ASPHI ADDRS FOR ERRORS
8498    4743:
8499    TEST350D:
8500            PO,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
8501                    LOAD-ERROR(TEST350D),                   !ERROR DIRECTORY KEY
8502                    DCS-CTR(C7.),                           !COMPARE AT TARGET
8503            NEXT,   J/COMP350D                              !
     (4743)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.000]
8504
8505    4250:  !(FREE)
8506    COMP350D:
8507            PO,     BUMP-VERIFY,                            !COUNT
8508            P2-T,   D←ASPHI[SF]-XOR-BSPLO[DF], SAVE-D[C],   !COMPARE RECEIVED:EXPECTED, BITWISE
8509            NEXT,   J/GOBUT350D                             !
     (4250)  DCS[0.00.0.0.0.1]  BM[0110..00.00..11.11..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.101.001]
8510
8511    4251:  !(FREE)
8512    GOBUT350D:
8513            PO,     BUMP-VERIFY,                            !COUNT
8514            SETUP,  RETURN/SCOPE350,                        !GO TO SUBR WHICH:
8515            NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTR5)
     (4251)  DCS[0.00.0.0.0.1]  BM[0100..00.01..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8516
8517
8518
8519    4252:  !(FREE)
8520    SCOPE350:
8521            P2-T,   D←SR, SAVE-D[C],                        !FOR DISPLAY OF SF/DM/DF
8522            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "RESETIR350" (+1. WORDS)  KEEP ON TESTING
8523                    J/RESETIR350                            !   ERROR:  "COMP350A"  (-11. WORDS)  HOLD UP PATTERN
     (4252)  DCS[0.00.0.1.0.0]  BM[1111..00.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...111.000.011]
8524
8525
8526
8527    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8528
8529    4703:
8530    RESETIR350:
8531            PO,     BUMP-VERIFY,                            !COUNT
8532            SETUP,  RETURN/NEXTPATA350,                     !PUT OLD PAT FROM SR INTO IR FOR DMD TEST
8533            NEXT,   CALL[SRINTOIR]                          !
     (4703)  DCS[0.00.0.0.0.1]  BM[0100..00.01..01.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.110.110]
```

```
8534
8535    4253:  !(FREE)
8536    NEXTPATA350:
8537            P2-T,   SR←D←SR-PLUS-CSPD(D15), SAVE-D[C],      !GENER NEXT PATTERN INTO D, SR
8538            NEXT,   BUTR(DMO),                              !IF TRUE:  "LOAD05-351" (+1. WORDS) ALL DONE HERE
8539                    J/DINTOIRA350                           !IF FALSE: "DINTOIRA" (-14. WORDS)  KEEP ON TESTING
    (4253)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.00..000..111...0.1.1..0..0...0.0010...0..0000.0...01.001...101.110.011]
8540
8541
8542
8543    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8544
8545    !COME HERE IF DONE LOOPING
8546    !THESE CONSTANTS ARE USED IN THE NEXT TESTS:
8547    4567:
8548    LOAD05-351:
8549            P0,     BUMP-VERIFY,                            !COUNT
8550            P3,     CSPD[05]←EMIT, EMIT/055255,             !SF=2, DF=5 CONSTANT
8551            NEXT,   J/LOAD06-351                            !
    (4567)  DCS[0.00.0.0.0.1]  BM[0101..10.10..10.10..101..101...0.0.0..0..0...0.1010...1..0000.0...11.000...010.101.100]
8552
8553    4254:  !(FREE)
8554    LOAD06-351:
8555            P3,     CSPD[06]←EMIT, EMIT/054344,             !SF=3, DF=4 CONSTANT
8556            NEXT,   J/TEST351A                              !
    (4254)  DCS[0.00.0.0.0.0]  BM[0101..10.10..00.11..100..100...0.0.0..0..0...0.1001...1..0000.0...11.000...111.011.010]
8557
8558
8559
8560
8561    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8562
8563    !TESTS 351 A-D VERIFY THAT THE RIF ADDRESS, WITH ASP HI/LO IMMED0/1 MODES, OPERATES CORRECTLY
8564
8565    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8566
8567    !TEST 351A CHECKS ASPLO RIF ADDR "001 0"=(02)
8568    4732:
8569    TEST351A:
8570            P0,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
8571                    LOAD-ERROR(TEST351A),                   !ERROR DIRECTORY KEY
8572                    DCS-CTR(C7.),                           !COMPARE AT TARGET
8573            NEXT,   J/COMP351A                              !
    (4732)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.100]
8574
8575    4704:
8576    COMP351A:
8577            P2-T,   D←CSPD[05]-XOR-ASPLO(R02), SAVE-D[C],   !COMPARE EXPECTED:RECEIVED, BITWISE
8578            NEXT,   J/GOBUT351A                             !CSP[05]=(055255)
    (4704)  DCS[0.00.0.0.0.0]  BM[0110..10.00..10.00..101..111...0.1.0..0..0...0.1010...0..0000.0...11.000...010.101.110]
8579
8580    4256:  !(FREE)
8581    GOBUT351A:
8582            P0,     BUMP-VERIFY,                            !COUNT
```

```
8583            SETUP,  RETURN/TEST351B,                        !GO TO SUBR WHICH:
8584            NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTR5)
     (4256)  DCS[0.00.0.0.0.1]  BM[0100..00.11..10.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8585
8586
8587    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8588
8589    !TEST 351B CHECKS ASPLO RIF ADDR "001 1"=(03)
8590    4722:
8591    TEST351B:
8592            PO,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
8593                    LOAD-ERROR(TEST351B),                   !ERROR DIRECTORY KEY
8594                    DCS-CTR(C7.),                           !COMPARE AT TARGET
8595            NEXT,   J/COMP351B                              !
     (4722)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.111]
8596
8597    4257:  !(FREE)
8598    COMP351B:
8599            P2-T,   D+CSPD[06]-XOR-ASPLO(R03), SAVE-D[C],   !COMPARE EXPECTED:RECEIVED, BITWISE
8600            NEXT,   J/GOBUT351B                             !CSP[06]=(054344)
     (4257)  DCS[0.00.0.0.0.0]  BM[0110..10.00..10.01..101..111...0.1.0..0..0...0.1001...0..0000.0...11.000...010.110.000]
8601
8602    4260:  !(FREE)
8603    GOBUT351B:
8604            SETUP,  RETURN/TEST351C,                        !GO TO SUBR WHICH:
8605            NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTR5)
     (4260)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8606
8607
8608    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8609
8610    !TEST 351C CHECKS ASPHI RIF ADDR "010 0"=(04)
8611    4723:
8612    TEST351C:
8613            PO,     LOAD-ENUA(ZTARGET434),                  !INSTRS FOR IR=(000000)
8614                    LOAD-ERROR(TEST351C),                   !ERROR DIRECTORY KEY
8615                    DCS-CTR(C7.),                           !COMPARE AT TARGET
8616                    BUMP-VERIFY,                            !COUNT
8617            NEXT,   J/COMP351C                              !
     (4723)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.001]
8618
8619    4261:  !(FREE)
8620    COMP351C:
8621            P2-T,   D+CSPD[06]-XOR-ASPHI(R04), SAVE-D[C],   !COMPARE EXPECTED:RECEIVED, BITWISE
8622            NEXT,   J/GOBUT351C                             !CSP[06]=(054344)
     (4261)  DCS[0.00.0.0.0.0]  BM[0110..10.00..11.00..110..111...0.1.0..0..0...0.1001...0..0000.0...11.000...010.110.010]
8623
8624    4262:  !(FREE)
8625    GOBUT351C:
8626            SETUP,  RETURN/TEST351D,                        !GO TO SUBR WHICH:
8627            NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTR5)
```

```
     (4262)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8628
8629
8630     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8631
8632     !TEST 351D CHECKS ASPHI RIF ADDR "010 1"=(05)
8633     4712:
8634     TEST351D:
8635             PO,     LOAD-ENUA(ZTARGET434),                          !INSTRS FOR IR=(000000)
8636                     LOAD-ERROR(TEST351D),                           !ERROR DIRECTORY KEY
8637                     DCS-CTR(C7.),                                   !COMPARE AT TARGET
8638             NEXT,   J/COMP351D                                      !
     (4712)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.011]
8639
8640     4263:  !(FREE)
8641     COMP351D:
8642             PO,     BUMP-VERIFY,                                    !COUNT
8643             P2-T,   D+CSPD[05]-XOR-ASPHI(R05), SAVE-D[C],           !COMPARE EXPECTED:RECEIVED, BITWISE
8644             NEXT,   J/GOBUT351D                                     !CSP[05]=(055255)
     (4263)  DCS[0.00.0.0.0.1]  BM[0110..10.00..11.01..110..111...0.1.0..0..0...0.1010...0..0000.0...11.000...010.110.100]
8645
8646     4264:  !(FREE)
8647     GOBUT351D:
8648             PO,     BUMP-VERIFY,                                    !COUNT
8649             SETUP,  RETURN/SCOPE351,                                !GO TO SUBR WHICH:
8650             NEXT,   CALL[DINTOIR-5]                                 !  D -> IR, BUT(INSTR5)
     (4264)  DCS[0.00.0.0.0.1]  BM[0100..00.01..01.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8651
8652
8653
8654     4265:  !(FREE)
8655     SCOPE351:
8656             NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "TEST352A" (+1. WORDS)
8657                     J/TEST352A                                      !   ERROR:  "COMP351A"  (-11. WORDS)
     (4265)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.000.101]
8658
8659
8660
8661
8662     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8663
8664     !TESTS 352 A-D VERIFY THAT THE RIF ADDRESS, WITH BSP HI/LO IMMEDO/1 MODES, OPERATES CORRECTLY
8665
8666     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8667
8668     !TEST 352A CHECKS BSPLO RIF ADDR "001 0"=(02)
8669     4705:
8670     TEST352A:
8671             PO,     LOAD-ENUA(ZTARGET434),                          !INSTRS FOR IR=(000000)
8672                     LOAD-ERROR(TEST352A),                           !ERROR DIRECTORY KEY
8673                     DCS-CTR(C7.),                                   !COMPARE AT TARGET
8674             NEXT,   J/COMP352A                                      !
     (4705)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...111.001.100]
```

```
8675
8676    4714:
8677    COMP352A:
8678            P2-T,   D+ASPLO[02]-XOR-BSPLO(R02), SAVE-D[C],  !COMPARE EXPECTED:RECEIVED, BITWISE
8679            NEXT,   J/GOBUT352A                             !DATA=(055255)
    (4714)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.00..101..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.110.110]
8680
8681    4266:  !(FREE)
8682    GOBUT352A:
8683            PO,     BUMP-VERIFY,                            !COUNT
8684            SETUP,  RETURN/TEST352B,                        !GO TO SUBR WHICH:
8685            NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTR5)
    (4266)  DCS[0.00.0.0.0.1]  BM[0100..00.11..10.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8686
8687
8688    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
8689
8690    !TEST 352B CHECKS BSPLO RIF ADDR "001 1"=(03)
8691    4713:
8692    TEST352B:
8693            PO,     LOAD-ENUA(ZTARGET434),                  !INSTR5 FOR IR=(000000)
8694                    LOAD-ERROR(TEST352B),                   !ERROR DIRECTORY KEY
8695                    DCS-CTR(C7.),                           !COMPARE AT TARGET
8696            NEXT,   J/COMP352B                              !
    (4713)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.111]
8697
8698    4267:  !(FREE)
8699    COMP352B:
8700            P2-T,   D+ASPLO[03]-XOR-BSPLO(R03), SAVE-D[C],  !COMPARE EXPECTED:RECEIVED, BITWISE
8701            NEXT,   J/GOBUT352B                             !DATA=(054344)
    (4267)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.01..101..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.000]
8702
8703    4270:  !(FREE)
8704    GOBUT352B:
8705            SETUP,  RETURN/TEST352C,                        !GO TO SUBR WHICH:
8706            NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTR5)
    (4270)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8707
8708
8709    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
8710
8711    !TEST 352C CHECKS BSPLO RIF ADDR "010 0"=(04)
8712    4724:
8713    TEST352C:
8714            PO,     LOAD-ENUA(ZTARGET434),                  !INSTR5 FOR IR=(000000)
8715                    LOAD-ERROR(TEST352C),                   !ERROR DIRECTORY KEY
8716                    DCS-CTR(C7.),                           !COMPARE AT TARGET
8717                    BUMP-VERIFY,                            !COUNT
8718            NEXT,   J/COMP352C                              !
    (4724)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.001]
8719
8720    4271:  !(FREE)
```

```
8721    COMP352C:
8722            P2-T,   D←ASPLO[04]-XOR-BSPLO(R04), SAVE-D[C],  !COMPARE EXPECTED:RECEIVED, BITWISE
8723            NEXT,   J/GOBUT352C                             !DATA=(053433)
    (4271)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.00..110..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.010]
8724
8725    4272:  !(FREE)
8726    GOBUT352C:
8727            SETUP,  RETURN/TEST352D,                        !GO TO SUBR WHICH:
8728            NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTR5)
    (4272)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8729
8730
8731    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8732
8733    !TEST 352D CHECKS BSPLO RIF ADDR "010 1"=(05)
8734    4725:
8735    TEST352D:
8736            P0,     LOAD-ENUA(ZTARGET434),                  !INSTR5 FOR IR=(000000)
8737                    LOAD-ERROR(TEST352D),                   !ERROR DIRECTORY KEY
8738                    DCS-CTR(C7.),                           !COMPARE AT TARGET
8739            NEXT,   J/COMP352D                              !
    (4725)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.011]
8740
8741    4273:  !(FREE)
8742    COMP352D:
8743            P0,     BUMP-VERIFY,                            !COUNT
8744            P2-T,   D←ASPLO[05]-XOR-BSPLO(R05), SAVE-D[C],  !COMPARE EXPECTED:RECEIVED, BITWISE
8745            NEXT,   J/GOBUT352D                             !DATA=(052522)
    (4273)  DCS[0.00.0.0.0.1]  BM[0110..00.11..10.01..110..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.100]
8746
8747    4274:  !(FREE)
8748    GOBUT352D:
8749            P0,     BUMP-VERIFY,                            !COUNT
8750            SETUP,  RETURN/SCOPE352,                        !GO TO SUBR WHICH:
8751            NEXT,   CALL[DINTOIR-5]                         !  D -> IR, BUT(INSTR5)
    (4274)  DCS[0.00.0.0.0.1]  BM[0100..00.01..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8752
8753
8754
8755    4275:  !(FREE)
8756    SCOPE352:
8757            P2-T,   D←CSPD(D13), D[C]←0,                    !RESTORE CONSTANT (000000)
8758            P3,     A≠BSPHI[01]←D,                          !
8759            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "RESTORE01" (+1. WORDS)
8760                    J/RESTORE01                             !   ERROR:  "COMP352A"  (-11. WORDS)
    (4275)  DCS[0.00.0.1.0.0]  BM[1010..10.11..00.01..100..000...0.1.0..0..0...0.0100...0..1011.0...11.000...111.001.101]
8761
8762
8763    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8764
8765    !       THIS SECTION OF CODE FINISHES RESTORING THE 4 CONSTANTS IN ASPHI/BSPHI
8766    !       THAT WERE WIPED OUT IN THE PREVIOUS GROUP OF TESTS.
```

```
8767
8768    4715:
8769    RESTORE01:
8770            P2-T,   D←CSPD(D10),                                    !(052525)
8771            P3,     A#BSPHI[07]←D,                                  !
8772            NEXT,   GOTO-PAGE(7),                                   !
8773                    J/RESTORE02                                     !
    (4715)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..111..111...0.1.0..0..0...0.0111...0..1011.0...11.100...000.011.000]
8774
8775    7030:  !(FREE)
8776    RESTORE02:
8777            P2-T,   D←CSPD(D11), D[C!←0,                            !(125252)
8778            P3,     A#BSPHI[05]←D,                                  !
8779            NEXT,   J/RESTORE03                                     !
    (7030)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..110..000...0.1.0..0..0...0.0110...0..1011.0...11.000...000.011.010]
8780
8781    7032:  !(FREE)
8782    RESTORE03:
8783            P2-T,   D←CSPD(D12), D[C]←0,                            !(177777)
8784            P3,     A#BSPHI[03]←D,                                  !
8785            NEXT,   J/RESTORE04                                     !
    (7032)  DCS[0.00.0.0.0.0]  BM[1010..10.11..00.01..101..000...0.1.0..0..0...0.0101...0..1011.0...11.000...000.011.011]
8786
8787    7033:  !(FREE)
8788    RESTORE04:
8789            SETUP,  RETURN/TEST361A,                                !GO TO SUBR THAT RESTORES CURRENT
8790            NEXT,   GOTO-PAGE(7),                                   !  DCS MICROCODE VERSION NUMBER,
8791                    J/INSERTREVNO                                   !  B<15>=(0), INTO B.M. GPR "R5"
    (7033)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.001.110]
8792
8793
8794
8795
8796
8797    !.PAGE=========================================================================================================
8798
8799
8800    .TOC   *   TEST361-372:  TESTING SR, GUARD, RES, AND XMUX
8801
8802    !*************************************************************************************
8803    !*
8804    !*      TESTS:  361 - 372                                  UWORDS: 125 + 117
8805    !*
8806    !*      FUNCTIONS:      TESTS THAT SR CAN BE LOADED FROM ALU OUT, READ THRU
8807    !*                      SR AND FLOAT PORTS OF XMUX, SR CAN BE SHIFTED LEFT, RIGHT,
8808    !*                      AND NOP, GUARD-ENABLED, DISABLED, SHIFTED, AND THAT
8809    !*                      ANY "BUTTABLE" BITS CAN BE TESTED.
8810    !*                      PREVIOUSLY TESTED IN TEST 105 A-E WAS THE ABILITY TO
8811    !*                      LOAD/READ THE SR THRU XMUX/SR, AND BUT(SR3-0).
8812    !*                      THESE FUNCTIONS ARE NOT TESTED HERE.
8813    !*
8814    !*************************************************************************************
8815
```

```
8816
8817
8818
8819
8820
8821    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8822
8823    !*** TEST 361A ***
8824    !TEST-361A TESTS THAT SR CAN BE LOADED, GUARD CLEARED, WITH PATTERN (052525)(0);
8825    !READ THRU XMUX-FLTPT PORT = (100125)
8826    6573:
8827    TEST361A:
8828            P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTR5 TEST
8829                    LOAD-ERROR(TEST361A),                   !ERROR DIRECTORY KEY
8830                    DCS-CTR(C11.),                          !COMPARE ENUA:TNUA AT TARGET
8831            NEXT,   J/SETRES361A                            !
    (6573)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...101.111.000]
8832
8833    6570:
8834    SETRES361A:
8835            P3,     CSPD[16]←EMIT,                          !CSP GETS
8836            EMITC,  SENDMUX-4567-SEL,                       !RES REG VALUES
8837                    SR-LOAD, GUARD-EN,                      !
8838            NEXT,   J/LOADRES361A                           !
    (6570)  DCS[0.00.0.0.0.0]  BM[0000..10.10..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.000.001]
8839
8840    6001:  !(FREE)
8841    LOADRES361A:
8842            P0,     BUMP-VERIFY,                            !COUNT
8843            P2-T,   RES←CSPB(B16),                          !STORE RES
8844                    D←ASPHI(C000000), D[C]←1,               !SET D=ZEROES, D[C]=1
8845            NEXT,   J/LOADSR361A                            !
    (6001)  DCS[0.00.0.0.0.1]  BM[1111..11.01..11.01..100..000...0.1.0..0..0...0.0000...0..1000.1...11.000...000.000.010]
8846
8847    6002:  !(FREE)
8848    LOADSR361A:
8849            P2-T,   SR←BSPHI(C052525),                      !LOAD SR WITH DATA
8850            NEXT,   J/EXPEC361B                             !
    (6002)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..111..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.000.011]
8851
8852    6003:  !(FREE)
8853    EXPEC361B:
8854            P0,     BUMP-VERIFY,                            !COUNT
8855            P3,     CSPD[16]←EMIT,                          !EXPECTED VALUE OUT OF XMUX-FLOAT
8856                    EMIT/100125,                            !(100125)
8857            NEXT,   J/COMP361B                              !
    (6003)  DCS[0.00.0.0.0.1]  BM[1000..10.00..00.01..010..101...0.0.0..0..0...0.0001...1..0000.0...11.000...000.000.100]
8858
8859    6004:  !(FREE)
8860    COMP361B:
8861            SETUP,  RETURN/TEST361D,                        !RETURN TO START OF NEXT SUBTEST
8862            NEXT,   CALL[CSP16XORFLTTOIR-5]                 !SUBR: CSP(16).XOR.FLOAT -> IR, BUT(INSTR5)
    (6004)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.101]
```

```
8863
8864
8865
8866
8867
8868    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8869
8870    !*** TEST 361D ***
8871    !TEST 361D CHECKS THAT THE BUT ON SR<1:0> READS THE (052525) IN THE SR CORRECTLY
8872    6771:
8873    TEST361D:
8874            PO,     LOAD-ENUA(ZTARGET403),                  !EXPECTED VALUE "01"#"1" IN SR<1:0>
8875                    LOAD-ERROR(TEST361D),                   !ERROR DIRECTORY KEY
8876                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA AT TARGET
8877            NEXT,   J/GOBUT361D                             !
    (6771)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.101]
8878
8879    6005:  !(FREE)
8880    GOBUT361D:
8881            SETUP,  RETURN/TEST361E,                        !RETURN TO START OF NEXT SUBTEST
8882            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
8883                    J/BUTSR1-0                              !GO BUT ON SR<1:0>
    (6005)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.101]
8884
8885
8886
8887
8888
8889    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8890
8891    !*** TEST 361E ***
8892    !TEST-361E CHECKS THAT GD<3:2> IS CLEARED UNDER SR-LOAD, GUARD-ENABLED
8893    6767:
8894    TEST361E:
8895            PO,     LOAD-ENUA(ZTARGET400),                  !EXPECTED VALUE "00" IN GUARD<3:2>
8896                    LOAD-ERROR(TEST361E),                   !ERROR DIRECTORY KEY
8897                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA AT TARGET
8898                    BUMP-VERIFY,                            !COUNT
8899            NEXT,   J/GOBUT361E                             !
    (6767)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.110]
8900
8901    6006:  !(FREE)
8902    GOBUT361E:
8903            SETUP,  RETURN/TEST362A,                        !RETURN TO START OF NEXT SUBTEST
8904            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
8905                    J/BUTGD3-2                              !GO BUT ON GD<3:2>
    (6006)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]
8906
8907
8908
8909
8910
```

```
8911    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8912
8913    !*** TEST 362A ***
8914    !TEST-362A CHECKS THAT THE SR#GD CAN BE SHIFTED RIGHT 1 POSITION, INSERTING
8915    !A "1" FROM D<00> INTO SR<15>, SHIFTING THE "1" IN SR<00> INTO GD<3>
8916    6765:
8917    TEST362A:
8918            P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTR5 TEST
8919                    LOAD-ERROR(TEST362A),                   !ERROR DIRECTORY KEY
8920                    DCS-CTR(C10.),                          !COMPARE ENUA:TNUA AT TARGET
8921            NEXT,   J/SETRES362A                            !
    (6765)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.000.111]
8922
8923    6007:  !(FREE)
8924    SETRES362A:
8925            P0,     BUMP-VERIFY,                            !COUNT
8926            P3,     CSPD[16]←EMIT,                          !CSP GETS
8927            EMITC,  SENDMUX-4567-SEL,                       !RES REG VALUES
8928                    SR-RIGHT, GUARD-EN,                     !
8929            NEXT,   J/SETDDC362A                            !
    (6007)  DCS[0.00.0.0.0.1]  BM[0010..10.10..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.001.000]
8930
8931    6010:  !(FREE)
8932    SETDDC362A:
8933            P2-T,   D←BSPHI(C000001), D[C]←0,               !SETUP D<00>=1 FOR SHIFT
8934            NEXT,   J/LOADRES362A                           !
    (6010)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...000.001.001]
8935
8936    6011:  !(FREE)
8937    LOADRES362A:
8938            P2,     RES←CSPB(B16),                          !STORE RES
8939            P3-T,   SR←SR-RIGHT-1,                          !SHIFT SR RIGHT, GUARD-ENABLED
8940            NEXT,   J/COMP362A                              !
    (6011)  DCS[0.00.0.0.0.0]  BM[0000..11.01..00.00..000..000...1.0.1..0..0...0.0000...0..1000.1...11.000...000.001.010]
8941
8942    6012:  !(FREE)
8943    COMP362A:
8944            P0,     BUMP-VERIFY,                            !COUNT
8945            P2-T,   D←SR-XOR-BSPHI(C125252), SAVE-D[C],     !D ← (125252)=SR, BITWISE
8946            NEXT,   J/GOBUT362A                             !
    (6012)  DCS[0.00.0.0.0.1]  BM[0110..01.11..00.00..110..111...0.1.0..0..0...0.0000...0..0000.0...11.000...000.001.011]
8947
8948    6013:  !(FREE)
8949    GOBUT362A:
8950            SETUP,  RETURN/TEST362B,                        !RETURN TO START OF NEXT SUBTEST
8951            NEXT,   CALL[DINTOIR-5]                         !SUBR: D -> IR, BUT(INSTR5)
    (6013)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
8952
8953
8954
8955
8956
8957    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```
8958
8959    !*** TEST 3628 ***
8960    !TEST-3628 CHECKS THAT SR-XMUX-FLOAT PORT CAN BE READ, WITH SR=(125252)
8961    6763:
8962    TEST3628:
8963            PO,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTR5 TEST
8964                    LOAD-ERROR(TEST3628),                   !ERROR DIRECTORY KEY
8965                    DCS-CTR(C8.),                           !COMPARE ENUA:TNUA AT TARGET
8966            NEXT,   J/EXPEC3628                             !
    (6763)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.100]
8967
8968    6014:   !(FREE)
8969    EXPEC3628:
8970            PO,     BUMP-VERIFY,                            !COUNT
8971            P3,     CSPD[16]+EMIT,                          !EXPECTED VALUE OF XMUX-FLOAT
8972                    EMIT/000052,                            !(000052)
8973            NEXT,   J/COMP3628                              !
    (6014)  DCS[0.00.0.0.0.1]  BM[0000..10.00..00.00..101..010...0.0.0..0..0...0.0001...1..0000.0...11.000...000.001.101]
8974
8975    6015:   !(FREE)
8976    COMP3628:
8977            SETUP,  RETURN/TEST362D,                        !RETURN TO START OF NEXT SUBTEST
8978            NEXT,   CALL[CSP16XORFLTTOIR-5]                 !SUBR: CSP(16).XOR.FLOAT -> IR, BUT(INSTR5)
    (6015)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.101]
8979
8980
8981
8982
8983
8984    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
8985
8986    !*** TEST 362D ***
8987    !TEST-362D CHECKS THAT THE BUT ON SR<1:0> READS THE (125252) IN THE SR CORRECTLY
8988    6757:
8989    TEST362D:
8990            PO,     LOAD-ENUA(ZTARGET405),                  !EXPECTED VALUE "10"&"1" IN SR<1:0>
8991                    LOAD-ERROR(TEST362D),                   !ERROR DIRECTORY KEY
8992                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA AT TARGET
8993            NEXT,   J/GOBUT362D                             !
    (6757)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.110]
8994
8995    6016:   !(FREE)
8996    GOBUT362D:
8997            SETUP,  RETURN/TEST362E,                        !RETURN TO START OF NEXT SUBTEST
8998            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
8999                    J/BUTSR1-0                              !GO BUT ON SR<1:0>
    (6016)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.101]
9000
9001
9002
9003
9004
```

```
9005    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9006
9007    !*** TEST 362E ***
9008    !TEST-362E CHECKS THAT GD<3:2> RECEIVED THE "1" IN SR<00> AFTER THE SHIFT RIGHT
9009    6755:
9010    TEST362E:
9011          PO,     LOAD-ENUA(ZTARGET402),                    !EXPECTED VALUE "10" IN GUARD<3:2>
9012                  LOAD-ERROR(TEST362E),                     !ERROR DIRECTORY KEY
9013                  DCS-CTR(C3.),                             !COMPARE ENUA:TNUA AT TARGET
9014          NEXT,   J/GOBUT362E                               !
    (6755)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.001.111]
9015
9016    6017:  !(FREE)
9017    GOBUT362E:
9018          SETUP,  RETURN/TEST363A,                          !RETURN TO START OF NEXT SUBTEST
9019          PO,     BUMP-VERIFY,                              !COUNT
9020          NEXT,   GOTO-PAGE(7),                             !BUT'S ARE ON PAGE 7
9021                  J/BUTGD3-2                                !GO BUT ON GD<3:2>
    (6017)  DCS[0.00.0.0.0.1]  BM[0110..00.11..11.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]
9022
9023
9024
9025
9026
9027    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9028
9029    !*** TEST 363A ***
9030    !TEST-363A CHECKS THAT THE SR#GD CAN AGAIN BE SHIFTED RIGHT 1 POSITION, INSERTING
9031    !A "0" FROM D<00> INTO SR<15>, SHIFTING THE "0" IN SR<00> INTO GD<3>
9032    6753:
9033    TEST363A:
9034          PO,     LOAD-ENUA(ZTARGET434),                    !SETUP FOR IR=(000000)/INSTRS TEST
9035                  LOAD-ERROR(TEST363A),                     !ERROR DIRECTORY KEY
9036                  DCS-CTR(C9.),                             !COMPARE ENUA:TNUA AT TARGET
9037          NEXT,   J/SETDDC363A                              !
    (6753)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.000]
9038
9039    6020:  !(FREE)
9040    SETDDC363A:
9041          P3-T,   D←NOT-ASPHI(C000001), D[C]←1,             !SETUP D=(177776), D[C]=0 FOR SHIFT RIGHT
9042          NEXT,   J/SHIFT363A                               !
    (6020)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...000.010.001]
9043
9044    6021:  !(FREE)
9045    SHIFT363A:
9046          PO,     BUMP-VERIFY,                              !COUNT
9047          P2-T,   SR←SR-RIGHT-1,                            !SHIFT SR RIGHT, GUARD-ENABLED
9048          NEXT,   J/COMP363A                                !
    (6021)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.010.010]
9049
9050    6022:  !(FREE)
9051    COMP363A:
9052          P2-T,   D←SR-XOR-BSPHI(C052525), SAVE-D[C],       !D ← (052525)=SR, BITWISE
```

```
9053                    NEXT,   J/GOBUT363A                             !
    (6022)  DCS[0.00.0.0.0.0]  BM[0110..01.11..00.00..111..111...0.1.0..0..0...0.0000...0..0000.0...11.000...000.010.011]
9054
9055        6023:  !(FREE)
9056        GOBUT363A:
9057                    SETUP,  RETURN/TEST363B,                        !RETURN TO START OF NEXT SUBTEST
9058                    NEXT,   CALL[DINTOIR-5]                         !SUBR: 0 -> IR, BUT(INSTR5)
    (6023)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
9059
9060
9061
9062
9063
9064        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9065
9066        !*** TEST 363B ***
9067        !TEST-363B CHECKS THE GUARD REGISTER WAS SHIFTED RIGHT ALSO
9068        6751:
9069        TEST363B:
9070                    PO,     LOAD-ENUA(ZTARGET401),                  !EXPECTED VALUE "01" IN GUARD<3:2>
9071                            LOAD-ERROR(TEST363B),                   !ERROR DIRECTORY KEY
9072                            DCS-CTR(C3.),                           !COMPARE ENUA:TNUA AT TARGET
9073                    NEXT,   J/GOBUT363B                             !
    (6751)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.100]
9074
9075        6024:  !(FREE)
9076        GOBUT363B:
9077                    SETUP,  RETURN/TEST364A,                        !RETURN TO START OF NEXT SUBTEST
9078                    NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
9079                            J/BUTGD3-2                              !GO BUT ON GD<3:2>
    (6024)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]
9080
9081
9082
9083
9084
9085        ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9086
9087        !*** TEST 364A ***
9088        !TEST-364A/364B CHECK THAT WE ARE ABLE TO FILTER A "1" DOWN TO GD<0>, AND
9089        !SUBSEQUENTLY ABLE TO RECOVER IT, SO GD<3:0>="0101"
9090        6747:
9091        TEST364A:
9092                    PO,     LOAD-ENUA(ZTARGET402),                  !EXPECTED VALUE "10" IN GUARD <3:2>
9093                            LOAD-ERROR(TEST364A),                   !ERROR DIRECTORY KEY
9094                            DCS-CTR(C4.),                           !COMPARE ENUA:TNUA AT TARGET
9095                            BUMP-VERIFY,                            !COUNT
9096                    NEXT,   J/SETDDC364A                            !
    (6747)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.101]
9097
9098        6025:  !(FREE)
9099        SETDDC364A:
```

```
9100            P2-T,   D←NOT-ASPHI(C000001), D[C]←1,           !SETUP D=(177776), D[C]=0 FOR SHIFT RIGHT
9101            NEXT,   J/GOBUT364A                             !  WHERE  SR<15> <- (0)
     (6025)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...000.010.110]
9102
9103     6026:  !(FREE)
9104     GOBUT364A:
9105            SETUP,  RETURN/TEST364B,                        !RETURN TO START OF NEXT SUBTEST
9106            P3-T,   SR←SR-RIGHT-1,                          !SHIFT SR#GD RIGHT
9107            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
9108                    J/BUTGD3-2                              !GO BUT ON GD<3:2>
     (6026)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..101..111...1.0.1..0..0...0.0000...0..0000.0...11.100...011.001.100]
9109
9110
9111
9112
9113
9114     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9115
9116     !*** TEST 364B ***
9117     !TEST-364B CHECKS THAT GD<3:2> READS AS "01"
9118     6745:
9119     TEST364B:
9120            P0,     LOAD-ENUA(ZTARGET401),                  !EXPECTED VALUE "01" IN GUARD<3:2>
9121                    LOAD-ERROR(TEST364B),                   !ERROR DIRECTORY KEY
9122                    DCS-CTR(C4.),                           !COMPARE ENUA:TNUA AT TARGET
9123            NEXT,   J/SETDDC364B                            !
     (6745)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.010.111]
9124
9125     6027:  !(FREE)
9126     SETDDC364B:
9127            P3-T,   D←BSPHI(C000001), D[C]←0,               !SETUP D, D[C] FOR SR<15>←"1"
9128            NEXT,   J/GOBUT364B                             !
     (6027)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...000.011.000]
9129
9130     6030:  !(FREE)
9131     GOBUT364B:
9132            SETUP,  RETURN/TEST365A,                        !RETURN TO START OF NEXT SUBTEST
9133            P2-T,   SR←SR-RIGHT-1,                          !SHIFT SR#GD RIGHT AGAIN
9134            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
9135                    J/BUTGD3-2                              !GO BUT ON GD<3:2>
     (6030)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..011..111...0.0.1..0..0...0.0000...0..0000.0...11.100...011.001.100]
9136
9137
9138
9139
9140
9141     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9142
9143     !*** TEST 365A ***
9144     !TEST-365A CHECKS THAT CAN SHIFT SR-RIGHT, W/GUARD-DISABLED
9145     6743:
9146     TEST365A:
```

```
9147            P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTRS TEST
9148                    LOAD-ERROR(TEST365A),                   !ERROR DIRECTORY KEY
9149                    DCS-CTR(C10.),                          !COMPARE ENUA:TNUA AT TARGET
9150            NEXT,   J/SETRES365A                            !
    (6743)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.001]
9151
9152    6031:   !(FREE)
9153    SETRES365A:
9154            P0,     BUMP-VERIFY,                            !COUNT
9155            P3,     CSP0[16]←EMIT,                          !CSP GETS
9156            EMITC,  SENDMUX-4567-SEL,                       !RES REG VALUES
9157                    SR-RIGHT, GUARD-DIS,                    !
9158            NEXT,   J/LOADRES365A                           !
    (6031)  DCS[0.00.0.0.0.1]  BM[0010..10.00..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.011.010]
9159
9160    6032:   !(FREE)
9161    LOADRES365A:
9162            P2,     RES←CSP8(B16),                          !STORE RES
9163            P3-T,   SR←SR-RIGHT-1,                          !SHIFT SR RIGHT, GUARD-DISABLED
9164            NEXT,   J/EXPEC365A                             !
    (6032)  DCS[0.00.0.0.0.0]  BM[0000..11.01..00.00..000..000...1.0.1..0..0...0.0000...0..1000.1...11.000...000.011.011]
9165
9166    6033:   !(FREE)
9167    EXPEC365A:
9168            P0,     BUMP-VERIFY,                            !COUNT
9169            P3,     CSP0[16]←EMIT,                          !EXPECTED VALUE OUT OF XMUX-SR
9170                    EMIT/145252,                            !(145252)
9171            NEXT,   J/COMP365A                              !
    (6033)  DCS[0.00.0.0.0.1]  BM[1100..10.10..10.10..101..010...0.0.0..0..0...0.0001...1..0000.0...11.000...000.011.100]
9172
9173    6034:   !(FREE)
9174    COMP365A:
9175            SETUP,  RETURN/TEST365B,                        !RETURN TO START OF NEXT SUBTEST
9176            NEXT,   CALL[CSP16XORSR↑OIR-5]                  !SUBR: CSP(16).XOR.SR -> IR, BUT(INSTR5)
    (6034)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.001]
9177
9178
9179
9180
9181
9182    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9183
9184    !*** TEST 365B ***
9185    !TEST-365B CHECKS THAT THE GUARD WASN'T ALTERED ON SHIFT RIGHT/DISABLED
9186    6741:
9187    TEST365B:
9188            P0,     LOAD-ENUA(ZTARGET401),                  !EXPECTED VALUE "01" IN GUARD<3:2>
9189                    LOAD-ERROR(TEST365B),                   !ERROR DIRECTORY KEY
9190                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA AT TARGET
9191            NEXT,   J/GOBUT365B                             !
    (6741)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.101]
9192
9193    6035:   !(FREE)
```

```
9194    GOBUT365B:
9195            SETUP,  RETURN/TEST366A,                        !RETURN TO START OF NEXT SUBTEST
9196            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
9197                    J/BUTGD3-2                              !GO BUT ON GD<3:2>
    (6035)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]
9198
9199
9200
9201
9202
9203    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9204
9205    !*** TEST 366A ***
9206    !TEST-366A CHECKS THAT SR CAN SHIFT LEFT, GUARD-DISABLED & NOT ALTERED, "0" IN
9207    !D[C] SHIFTED INTO SR<00>
9208    6737:
9209    TEST366A:
9210            P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTRS TEST
9211                    LOAD-ERROR(TEST366A),                   !ERROR DIRECTORY KEY
9212                    DCS-CTR(C11.),                          !COMPARE ENUA:TNUA AT TARGET
9213            NEXT,   J/SETRES366A                            !
    (6737)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.011.110]
9214
9215    6036:  !(FREE)
9216    SETRES366A:
9217            P0,     BUMP-VERIFY,                            !COUNT
9218            P3,     CSPD[16]←EMIT,                          !CSP GETS
9219            EMITC,  SENDMUX-4567-SEL,                       !RES REG VALUES
9220                    SR-LEFT, GUARD-DIS,                     !
9221            NEXT,   J/LOADRES366A                           !
    (6036)  DCS[0.00.0.0.0.1]  BM[0001..10.00..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.011.111]
9222
9223    6037:  !(FREE)
9224    LOADRES366A:
9225            P2-T,   RES←CSPB(B16),                          !STORE RES
9226                    D←ZERO, D[C]←ALU07,                     !AND SET D, D[C]
9227            NEXT,   J/SHIFT366A                             !
    (6037)  DCS[0.00.0.0.0.0]  BM[0011..11.01..00.00..000..011...0.1.0..0..0...0.0000...0..1000.1...11.000...000.100.000]
9228
9229    6040:  !(FREE)
9230    SHIFT366A:
9231            P0,     BUMP-VERIFY,                            !COUNT
9232            P3-T,   SR←SR-LEFT-1,                           !SHIFT SR LEFT 1, SR<00>←D[C]="0"
9233            NEXT,   J/EXPEC366A                             !
    (6040)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.00..000..000...1.0.1..0..0...0.0000...0..0000.0...11.000...000.100.001]
9234
9235    6041:  !(FREE)
9236    EXPEC366A:
9237            P3,     CSPD[16]←EMIT,                          !EXPECTED RESULT AFTER SHIFT
9238                    EMIT/112524,                            !(112524)
9239            NEXT,   J/COMP366A
    (6041)  DCS[0.00.0.0.0.0]  BM[1001..10.01..01.01..010..100...0.0.0..0..0...0.0001...1..0000.0...11.000...000.100.010]
9240
```

```
9241    6042:  !(FREE)
9242    COMP366A:
9243            SETUP,  RETURN/TEST366B,                        !RETURN TO START OF NEXT SUBTEST
9244            NEXT,   CALL[CSP16XORSRTOIR-5]                  !SUBR: CSP(16).XOR.SR -> IR, BUT(INSTR5)
     (6042)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.001]
9245
9246
9247
9248
9249
9250
9251    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9252
9253    !*** TEST 366B ***
9254    !TEST-366B CHECKS THAT GUARD WASN'T ALTERED ON SHIFT LEFT/GUARD-DISABLED
9255    6735:
9256    TEST366B:
9257            P0,     LOAD-ENUA(ZTARGET401),                  !GUARD SHOULD STILL BE "01"#"01"
9258                    LOAD-ERROR(TEST366B),                   !ERROR DIRECTORY KEY
9259                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA AT TARGET
9260            NEXT,   J/GOBUT366B
     (6735)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.011]
9261
9262    6043:  !(FREE)
9263    GOBUT366B:
9264            SETUP,  RETURN/TEST366C,                        !RETURN TO START OF NEXT SUBTEST
9265            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
9266                    J/BUTGD3-2                              !GO BUT ON GUARD <3:2>
     (6043)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]
9267
9268
9269
9270
9271
9272
9273    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9274
9275    !*** TEST 366C ***
9276    !TEST-366C CHECKS THAT SR CAN AGAIN SHIFT LEFT, GUARD-DISABLED, SR<00>←D[C]="1"
9277    6733:
9278    TEST366C:
9279            P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTR5 TEST
9280                    LOAD-ERROR(TEST366C),                   !ERROR DIRECTORY KEY
9281                    DCS-CTR(C10.),                          !COMPARE ENUA:TNUA AT TARGET
9282            NEXT,   J/SETDDC366C
     (6733)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.100.100]
9283
9284    6044:  !(FREE)
9285    SETDDC366C:
9286            P2-T,   D←ASPHI(C177777), D[C]←1,               !SETUP D, D[C]
9287            NEXT,   J/SHIFT366C                             !
     (6044)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..101..000...0.1.0..0..0...0.0000...0..0000.0...11.000...000.100.101]
```

```
9288
9289    6045:  !(FREE)
9290    SHIFT366C:
9291            P2-T,   SR←SR-LEFT-1,                           !SHIFT SR LEFT 1, SR<00>←D[C]="1"
9292            NEXT,   J/EXPEC366C
    (6045)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.100.110]
9293
9294    6046:  !(FREE)
9295    EXPEC366C:
9296            P0,     BUMP-VERIFY,                            !COUNT
9297            P3,     CSPD[16]←EMIT,                          !EXPECTED VALUE AFTER SHIFT
9298                    EMIT/025251,                            !(025251)
9299            NEXT,   J/COMP366C                              !
    (6046)  DCS[0.00.0.0.0.1]  BM[0010..10.10..10.10..101..001...0.0.0..0..0...0.0001...1..0000.0...11.000...000.100.111]
9300
9301    6047:  !(FREE)
9302    COMP366C:
9303            SETUP,  RETURN/TEST367A,                        !RETURN TO START OF NEXT SUBTEST
9304            NEXT,   CALL[CSP16XORSRTOIR-5]                  !SUBR: CSP(16).XOR.SR -> IR, BUT(INSTR5)
    (6047)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.001]
9305
9306
9307
9308
9309
9310
9311    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9312
9313    !*** TEST 367A ***
9314    !TEST-367A CHECKS THAT LOAD/GUARD-DISABLED LOADS SR, GUARD NOT ALTERED
9315    !CHECK THAT BUTA(CLEAR-FLAGS) CLEARS RES TO SR-LOAD/GUARD-DIS
9316    6731:
9317    TEST367A:
9318            P0,     LOAD-ENUA(ZTARGET401),                  !GUARD SHOULD STILL BE "01"#"01" AFTER LOAD
9319                    LOAD-ERROR(TEST367A),                   !ERROR DIRECTORY KEY
9320                    DCS-CTR(C6.),                           !COMPARE ENUA:TNUA AT TARGET
9321            NEXT,   J/SETRES367A                            !
    (6731)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.000]
9322
9323    6050:  !(FREE)
9324    SETRES367A:
9325            P0,     BUMP-VERIFY,                            !COUNT
9326            P3,     CSPD[16]←EMIT,                          !CSP GETS
9327            EMITC,  SENDMUX-4567-SEL,                       !RES VALUES
9328                    SR-NOP, GUARD-EN,                       !FIRST LOAD COMPLEMENT OF THOSE AFTER BUTA(CLEAR-FLAGS)
9329            NEXT,   J/LOADRES367A                           !
    (6050)  DCS[0.00.0.0.0.1]  BM[0011..10.10..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.101.001]
9330
9331    6051:  !(FREE)
9332    LOADRES367A:
9333            P0,     BUMP-VERIFY,                            !COUNT
9334            P2-T,   RES←CSPB(B16),                          !STORE RES
9335                    D←ZERO, D[C]←ALU07,                     !SET D, D[C]
```

```
9336            P3,     BUTA(CLR-FLAG-RES-UCON),                !RESET RES TO SR-LOAD, GUARD-DIS
9337            NEXT,   J/LOADSR367A                            !
    (6051)  DCS[0.00.0.0.0.1]  BM[0011..11.01..00.00..000..011...0.1.0..0..0...0.0000...0..1000.1...11.010...000.101.010]
9338
9339    6052:   !(FREE)
9340    LOADSR367A:
9341            P2-T,   SR←BSPHI(C052525),                      !SR←(052525)
9342            NEXT,   J/GOBUT367B                             !
    (6052)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..111..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.101.011]
9343
9344    6053:   !(FREE)
9345    GOBUT367B:
9346            SETUP,  RETURN/TEST370A,                        !RETURN TO START OF NEXT SUBTEST
9347            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
9348                    J/BUTGD3-2                              !GO BUT ON GUARD <3:2>
    (6053)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]
9349
9350
9351
9352
9353
9354
9355    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9356
9357    !*** TEST 370A ***
9358    !TEST-370A CHECKS THAT SHIFT LEFT/GUARD-ENABLED SHIFTS GD<3>="0" INTO SR<00>
9359    6725:
9360    TEST370A:
9361            P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTRS TEST
9362                    LOAD-ERROR(TEST370A),                   !ERROR DIRECTORY KEY
9363                    DCS-CTR(C10.),                          !COMPARE ENUA:TNUA AT TARGET
9364            NEXT,   J/SETRES370A                            !
    (6725)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.101.100]
9365
9366    6054:   !(FREE)
9367    SETRES370A:
9368            P0,     BUMP-VERIFY,                            !COUNT
9369            P3,     CSPD[16]←EMIT,                          !CSP GETS
9370            EMITC,  SENDMUX-4567-SEL,                       !RES VALUES
9371                    SR-LEFT, GUARD-EN,                      !
9372            NEXT,   J/LOADRES370A                           !
    (6054)  DCS[0.00.0.0.0.1]  BM[0001..10.10..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.101.101]
9373
9374    6055:   !(FREE)
9375    LOADRES370A:
9376            P2-T,   RES←CSPB(B16),                          !STORE RES
9377                    D←ASPHI(C000000), D[C]←1,               !SETUP D, D[C]
9378            NEXT,   J/SHIFT370A                             !
    (6055)  DCS[0.00.0.0.0.0]  BM[1111..11.01..11.01..100..000...0.1.0..0..0...0.0000...0..1000.1...11.000...000.101.110]
9379
9380    6056:   !(FREE)
9381    SHIFT370A:
9382            P2-T,   SR←SR-LEFT-1,                           !SHIFT SR LEFT 1, SR<00>←GD<3>="0"
```

```
9383            NEXT,   J/COMP370A                                      !
    (6056)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.101.111]
9384
9385    6057:   !(FREE)
9386    COMP370A:
9387            P2-T,   D←SR-XOR-BSPHI(C125252), SAVE-D[C],     !D ← (125252)=SR,  BITWISE
9388            NEXT,   J/GOBUT370A
    (6057)  DCS[0.00.0.0.0.0]  BM[0110..01.11..00.00..110..111...0.1.0..0..0...0.0000...0..0000.0...11.000...000.110.000]
9389
9390    6060:   !(FREE)
9391    GOBUT370A:
9392            SETUP,  RETURN/TEST370B,                                !RETURN TO START OF NEXT SUBTEST
9393            NEXT,   CALL[DINTOIR-5]                                 !SUBR: D -> IR, BUT(INSTR5)
    (6060)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
9394
9395
9396
9397
9398
9399
9400    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9401
9402    !*** TEST 370B ***
9403    !TEST-370B CHECKS THAT THE GUARD, NOW ENABLED, WAS ALSO SHIFTED LEFT
9404    6723:
9405    TEST370B:
9406            PO,     LOAD-ENUA(ZTARGET402),                          !GUARD IS NOW "10"#"10"
9407                    LOAD-ERROR(TEST370B),                           !ERROR DIRECTORY KEY
9408                    DCS-CTR(C3.),                                   !COMPARE ENUA:TNUA AT TARGET
9409            NEXT,   J/GOBUT370B                                     !
    (6723)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.001]
9410
9411    6061:   !(FREE)
9412    GOBUT370B:
9413            SETUP,  RETURN/TEST370C,                                !RETURN TO START OF NEXT SUBTEST
9414            PO,     BUMP-VERIFY,                                    !COUNT
9415            NEXT,   GOTO-PAGE(7),                                   !BUT'S ARE ON PAGE 7
9416                    J/BUTGD3-2                                      !GO BUT ON GUARD <3:2>
    (6061)  DCS[0.00.0.0.0.1]  BM[0110..00.11..10.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]
9417
9418
9419
9420
9421
9422
9423
9424    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9425
9426    !*** TEST 370C ***
9427    !TEST-370C CHECKS THAT SHIFT LEFT/GUARD-ENABLED SHIFTS GD<3>="1" INTO SR<00>
9428    6721:
9429    TEST370C:
```

```
9430            P0,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTR5 TEST
9431                    LOAD-ERROR(TEST370C),                   !ERROR DIRECTORY KEY
9432                    DCS-CTR(C9.),                           !COMPARE ENUA:TNUA AT TARGET
9433            NEXT,   J/SETDDC370C                            !
    (6721)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.010]
9434
9435    6062:  !(FREE)
9436    SETDDC370C:
9437            P0,     BUMP-VERIFY,                            !COUNT
9438            P2-T,   D←ZERO, D[C]←ALU07,                     !SET D, D[C]
9439            NEXT,   J/SHIFT370C                             !
    (6062)  DCS[0.00.0.0.0.1]  BM[0011..00.00..00.00..000..011...0.1.0..0..0...0.0000...0..0000.0...11.000...000.110.011]
9440
9441    6063:  !(FREE)
9442    SHIFT370C:
9443            P3-T,   SR←SR-LEFT-1,                           !SHIFT SR LEFT, SR<00>←GD<3>="1"
9444            NEXT,   J/COMP370C                              !
    (6063)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...1.0.1..0..0...0.0000...0..0000.0...11.000...000.110.100]
9445
9446    6064:  !(FREE)
9447    COMP370C:
9448            P2-T,   D←SR-XOR-BSPHI(C052525), SAVE-D[C],     !D ← (052525)=SR, BITWISE
9449            NEXT,   J/GOBUT370C                             !
    (6064)  DCS[0.00.0.0.0.0]  BM[0110..01.11..00.00..111..111...0.1.0..0..0...0.0000...0..0000.0...11.000...000.110.101]
9450
9451    6065:  !(FREE)
9452    GOBUT370C:
9453            SETUP,  RETURN/TEST370D,                        !RETURN TO START OF NEXT SUBTEST
9454            NEXT,   CALL[DINTOIR-5]                         !SUBR: D -> IR, BUT(INSTR5)
    (6065)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
9455
9456
9457
9458
9459
9460
9461
9462    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9463
9464    !*** TEST 370D ***
9465    !TEST-370D CHECKS THAT THE "1" THAT GOT PUT IN GD<0> CAN BE SHIFTED BACK
9466    6717:
9467    TEST370D:
9468            P0,     LOAD-ENUA(ZTARGET401),                  !GUARD IS NOW "01"#"00"
9469                    LOAD-ERROR(TEST370D),                   !ERROR DIRECTORY KEY
9470                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA AT TARGET
9471            NEXT,   J/GOBUT370D                             !
    (6717)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.110]
9472
9473    6066:  !(FREE)
9474    GOBUT370D:
9475            SETUP,  RETURN/TEST371A,                        !RETURN TO START OF NEXT SUBTEST
9476            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
```

```
9477                    J/BUTGD3-2                                  !GO BUT ON GUARD <3:2>
     (6066)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]
9478
9479
9480
9481
9482
9483
9484
9485    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9486
9487    !*** TEST 371A ***
9488    !TEST-371A CHECKS THAT SR-NOP FUNCTION DOES NOTHING
9489    6715:
9490    TEST371A:
9491            PO,     LOAD-ENUA(ZTARGET434),                      !SETUP FOR IR=(000000)/INSTR5 TEST
9492                    LOAD-ERROR(TEST371A),                       !ERROR DIRECTORY KEY
9493                    DCS-CTR(C10.),                              !COMPARE ENUA:TNUA AT TARGET
9494            NEXT,   J/SETRES371A                                !
     (6715)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...000.110.111]
9495
9496    6067:  !(FREE)
9497    SETRES371A:
9498            PO,     BUMP-VERIFY,                                !COUNT
9499            P3,     CSPD[16]←EMIT,                              !CSP GETS
9500            EMITC,  SENDMUX-4567-SEL,                           !RES VALUES
9501                    SR-NOP, GUARD-EN,                           !
9502            NEXT,   J/LOADRES371A                               !
     (6067)  DCS[0.00.0.0.0.1]  BM[0011..10.10..00.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...000.111.000]
9503
9504    6070:  !(FREE)
9505    LOADRES371A:
9506            P2-T,   RES←CSPB(B16),                              !STORE RES
9507                    D←ASPHI(C000000), D[C]←1,                   !SETUP D, D[C]
9508            NEXT,   J/SHIFT371A                                 !
     (6070)  DCS[0.00.0.0.0.0]  BM[1111..11.01..11.01..100..000...0.1.0..0..0...0.0000...0..1000.1...11.000...000.111.001]
9509
9510    6071:  !(FREE)
9511    SHIFT371A:
9512            PO,     BUMP-VERIFY,                                !COUNT
9513            P2-T,   CLK-SR,                                     !DO AN SR-NOP
9514            NEXT,   J/COMP371A                                  !
     (6071)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...000.111.010]
9515
9516    6072:  !(FREE)
9517    COMP371A:
9518            P2-T,   D←SR-XOR-BSPHI(C052525), SAVE-D[C],         !D ← (052525)=SR, BITWISE
9519            NEXT,   J/GOBUT371A                                 !
     (6072)  DCS[0.00.0.0.0.0]  BM[0110..01.11..00.00..111..111...0.1.0..0..0...0.0000...0..0000.0...11.000...000.111.011]
9520
9521    6073:  !(FREE)
9522    GOBUT371A:
9523            SETUP,  RETURN/TEST371B,                            !RETURN TO START OF NEXT SUBTEST
```

```
9524            P0,     BUMP-VERIFY,                            !COUNT
9525            NEXT,   CALL[DINTOIR-5]                         !SUBR: D -> IR, BUT(INSTR5)
     (6073)  DCS[0.00.0.0.0.1]  BM[0110..00.11..10.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
9526
9527
9528
9529
9530
9531
9532
9533    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9534
9535    !*** TEST 371B ***
9536    !TEST-371B CHECKS THAT THE GUARD WASN'T ALTERED EITHER
9537    6713:
9538    TEST371B:
9539            P0,     LOAD-ENUA(ZTARGET401),                  !GUARD IS STILL "01"#"00"
9540                    LOAD-ERROR(TEST371B),                   !ERROR DIRECTORY KEY
9541                    DCS-CTR(C3.),                           !COMPARE ENUA:TNUA AT TARGET
9542            NEXT,   J/GOBUT371B                             !
     (6713)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...000.111.100]
9543
9544    6074:  !(FREE)
9545    GOBUT371B:
9546            SETUP,  RETURN/SCOPE371,                        !RETURN TO SCOPE LOOP TEST WORD
9547            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
9548                    J/BUTGD3-2                              !GO BUT ON GUARD <3:2>
     (6074)  DCS[0.00.0.0.0.0]  BM[0110..00.00..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.100]
9549
9550
9551    !SCOPE LOOP TEST FOR SR, GUARD, XMUX, RES AREA CODE
9552    6075:  !(FREE)
9553    SCOPE371:
9554            P0,     BUMP-VERIFY,                            !COUNT
9555            P2,     RES←CSPD(C000000),                      !RESET RES TO SR-LOAD/GUARD-DIS
9556            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST372A" [+3. WORDS]
9557                    J/TEST372A                              !   ERROR:  "SETRES361A" [-85. WORDS]
     (6075)  DCS[0.00.0.1.0.1]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.0100...0..1000.1...11.000...101.111.001]
9558
9559
9560
9561
9562    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9563
9564    !       THE LLOWING TWO SUBROUTINES ARE ALSO USED IN THE ABOVE TESTS:
9565
9566
9567    7031:  !(FREE)
9568    CSP16XORSRTOIR5:
9569            P2-T,   D←SR-XOR-CSPB(B16), SAVE-D[C],          !COMPARE SR-XMUX:EXPECTED VALUE, BITWISE
9570            NEXT,   J/DINTOIR5                              !  AND PUT IN IR TO DO INSTR5 TEST
     (7031)  DCS[0.00.0.0.0.0]  BM[0110..11.01..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.011]
```

```
9571
9572
9573    7035:  !(FREE)
9574    CSP16XORFLTTOIR5:
9575            P2-T,   D←FLTPT-XOR-CSPB(B16), SAVE-D[C],       !COMPARE FLTPT-XMUX:EXPECTED VALUE, BITWISE
9576            NEXT,   J/DINTOIR5                              !  AND PUT IN IR TO DO INSTR5 TEST
    (7035)  DCS[0.00.0.0.0.0]  BM[0110..11.01..00.01..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.011]
9577
9578
9579
9580
9581
9582    !.PAGE=============================================================================================================
9583
9584
9585    .TOC   *   TEST372A-372B:  TESTING CUA, PROCESSOR MUX, AND BUTA[SUBR A]
9586
9587    !*************************************************************************************
9588    !*
9589    !*      TESTS:  372A - 372B                                  UWORDS: 015 + 002
9590    !*
9591    !*      FUNCTIONS:      TESTS THAT CUA IS LOADED, AND CAN BE READ THRU PROCESSOR MUX.
9592    !*                      ALSO TESTS THAT CAN BE PUT INTO D, AND BUT[SUBR A] LOADS
9593    !*                      D<14:03> INTO RETURN.
9594    !*
9595    !*************************************************************************************
9596
9597
9598
9599
9600
9601    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9602
9603    !*** TEST 372A ***
9604    !TEST-372A CHECKS THE CUA -> D -> SUBR A -> RETURN PATH WITH PATTERN [6222]
9605    6571:
9606    TEST372A:
9607            PO,     LOAD-ENUA(CUA372A),                     !WHERE WE BUT [RETURN] TO
9608                    LOAD-ERROR(TEST372A),                   !ERROR DIRECTORY KEY
9609                    DCS-CTR(C7.),                           !IN 7. MICROWORDS
9610            NEXT,   J/LOOP372A                              !
    (6571)  DCS[1.00.1.0.0.0]  BM[1000..00.11..00.10..010..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.000]
9611
9612    6540:
9613    LOOP372A:
9614            SELECT, UCON-PROC,                              !SELECT PROCESSOR UCON CONTROL
9615            ENABLE, BUSDIN←CUA[14-03],                      !  PUT D#CUA[11-00]#EXFLAG<2:1>#FOVP ON BUSDIN
9616            PO,     SET-UCON-CONTROL,                       !LOAD UCON REGISTER AT PO
9617                    BUMP-VERIFY,                            !COUNT
9618            P3,     BUTA(CUA-TRACK),                        !RESET TRACKING OF CUA
9619            NEXT,   J/SETDC372A                             !
    (6540)  DCS[0.00.0.0.0.1]  BM[0000..00.00..01.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.001...000.111.110]
9620
9621    6076:  !(FREE)
```

```
9622    SETDC372A:
9623            P2-T,   D←ASPHI(C000000), D[C]←1,               !SET D[C] FLAG = (1) FOR FIRST LOOP
9624            NEXT,   J/CUA372A                               !
    (6076)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..100..000...0.1.0..0..0...0.0000...0..0000.0...11.000...010.010.010]
9625
9626    6222:
9627    CUA372A:
9628            P3,     CSPD[16]←BUSDIN, RETURN/BUTERROR6,      !COPY CUA [WHICH IS ADDRESS OF THIS UWORD] INTO CSP
9629            NEXT,   BUTR(D[C]-B),                           !IF D[C] SET [PASS 1], GO TO "LOAD372A"
9630                    J/TEST372B                              !IF D[C] RESET [PASS 2], GO TO "TEST372B"
    (6222)  DCS[0.00.0.0.0.0]  BM[0110..10.01..11.11..110..000...0.0.0..0..0...0.0001...1..0000.0...10.011...111.000.001]
9631
9632    6703:
9633    LOAD372A:
9634            P0,     BUMP-VERIFY,                            !COUNT
9635            P2-T,   D←CSPB(B16), D[C]←0,                    !PUT CUA FROM CSP INTO D, RESET D[C]
9636            NEXT,   J/SUBRA372A                             !
    (6703)  DCS[0.00.0.0.0.1]  BM[1010..11.01..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...000.111.111]
9637
9638    6077:  !(FREE)
9639    SUBRA372A:
9640            SETUP,  RETURN/BUTERROR6,                       !IF BUTA(SUBR-B) USED INSTEAD
9641            NEXT,   PAGE(7),                                !SUBROUTINE IS ON PAGE 7
9642                    BUTA(SUBR-A),                           !LOAD PAGE, LOAD RETURN FROM D
9643                    J/ZTARGET555                            !THE SUBROUTINE
    (6077)  DCS[0.00.0.0.0.0]  BM[0110..00.01..11.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.101...101.101.101]
9644
9645    !NEXT WORD COMES FROM 'ZTARGET555', WHICH DOES ONLY A BUTA[RETURN],
9646    !WHICH SHOULD RETURN TO 'CUA372A' [-3. WORDS]
9647
9648
9649
9650
9651
9652
9653    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9654
9655    !*** TEST 372B ***
9656    !TEST-372B CHECKS THE CUA -> D -> SUBR A -> RETURN PATH WITH PATTERN [5555]
9657    6701:
9658    TEST372B:
9659            P0,     LOAD-ENUA(CUA372B),                     !WHERE WE BUT[RETURN] TO
9660                    LOAD-ERROR(TEST372B),                   !ERROR DIRECTORY KEY
9661                    DCS-CTR(C7.),                           !IN 7. MICROWORDS
9662            NEXT,   J/PAGE372B                              !
    (6701)  DCS[1.00.1.0.0.0]  BM[1000..00.10..11.01..101..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.000]
9663
9664    6100:  !(FREE)
9665    PAGE372B:
9666            SETUP,  RETURN/BUTERROR5,                       !JUNK IN RETURN REGISTER
9667            NEXT,   GOTO-PAGE(5),                           !XFER TO PAGE 5
9668                    J/SETDC372B                             !
```

```
      (6100)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.11..110..101...0.0.0..0..0...0.0000...0..0000.0...11.100...000.000.000]
9669
9670     5000:  !(FREE)
9671     SETDC372B:
9672             PO,     BUMP-VERIFY,                                    !COUNT
9673             P2-T,   D←RSPHI(C000000), D[C]←1,                       !SET D[C] FLAG = (1) FOR FIRST LOOP
9674             P3,     BUTA(CUA-TRACK),                                !RESET TRACKING OF CUA
9675             NEXT,   J/CUA372B                                       !
      (5000)  DCS[0.00.0.0.0.1]  BM[1111..00.00..11.01..100..000...0.1.0..0..0...0.0000...0..0000.0...11.001...101.101.101]
9676
9677     5555:
9678     CUA372B:
9679             P3,     CSPD[16]←BUSDIN, RETURN/BUTERROR5,              !COPY CUA [WHICH IS ADDRESS OF THIS WORD] INTO CSP
9680             NEXT,   BUTR(D[C]-B),                                   !IF D[C] SET [PASS 1], GO TO "LOAD372B"
9681                     J/SCOPE372B                                     !IF D[C] RESET [PASS2], GO TO "SCOPE372B"
      (5555)  DCS[0.00.0.0.0.0]  BM[0101..10.01..11.11..110..000...0.0.0..0..0...0.0001...1..0000.0...10.011...101.000.001]
9682
9683     5503:
9684     LOAD372B:
9685             P2-T,   D←CSPB(B16), D[C]←0,                            !PUT CUA FROM CSP INTO D, RESET D[C]
9686             NEXT,   J/SUBRA372B                                     !
      (5503)  DCS[0.00.0.0.0.0]  BM[1010..11.01..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...010.010.011]
9687
9688     5223:  !(FREE)
9689     SUBRA372B:
9690             PO,     BUMP-VERIFY,                                    !COUNT
9691             SETUP,  RETURN/BUTERROR5,                               !IF BUTA(SUBR-B) USED INSTEAD
9692             NEXT,   PAGE(7),                                        !SUBROUTINE IS ON PAGE 7
9693                     BUTA(SUBR-A),                                   !LOAD PAGE, LOAD RETURN FROM D
9694                     J/RESETUCONP                                    !THE SUBR:  RESETS PROC UCON:  BUSDIN←EMIT, EN-CLK-IR
      (5223)  DCS[0.00.0.0.0.1]  BM[0101..00.01..11.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.101...010.111.001]
9695
9696     !NEXT WORD COMES FROM 'RESETUCONP', WHICH DOES ONLY A BUTA[RETURN],
9697     !WHICH SHOULD RETURN TO 'CUA372B' [-3.WORDS]
9698
9699     5501:
9700     SCOPE372B:
9701             NEXT,   GOTO-PAGE(6),                                   !XFER
9702                     BUTD[SCOPE],                                    !NO ERROR:  "TEST373A" [+1.WORDS]
9703                     J/TEST373A                                      !   ERROR:  "LOOP372A" [-12.WORDS]
      (5501)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...101.100.001]
9704
9705
9706
9707
9708
9709     !.PAGE=============================================================================================================
9710
9711
9712     .TOC   *   TEST373:  CHECK JAMUPP W/ BUTA(DIAGNOSE), BM EXT BIT FLPADR
9713
9714
```

```
9715    !*************************************************************************************************
9716    !*
9717    !*      TESTS:  373 A - B                                       UWORDS:  007 + 014
9718    !*
9719    !*      FUNCTIONS:
9720    !*
9721    !*      THE FOLLOWING SET OF TWO TESTS PERFORMS SEVERAL FUNCTIONS:
9722    !*
9723    !*              TEST-373-A CHECKS THAT CONTROL CAN BE PASSED TO THE BASE MACHINE, VIA
9724    !*              BUTA(DIAGNOSE), AND SEVERAL B.M. WORDS EXECUTED.  A BUTA(DIAGNOSE) IN
9725    !*              THE B.M. SHOULD THEN BE ENCOUNTERED, RETURNING CONTROL TO THE DCS VIA
9726    !*              A JAMUPP FORCE.
9727    !*
9728    !*              TEST-373-B THEN CHECKS THAT THE B.M. MACHINE CODE CORRECTLY
9729    !*              ASSERTED THE "FLPADR-L" EXTENSION BIT, FORCING A READ, VIA THE ASP/DF
9730    !*              FIELD MODE, OF A SCRATCHPAD.
9731    !*
9732    !*************************************************************************************************
9733
9734
9735
9736    !THIS TEST GOES TO THE B.M. VIA BUTA(DIAGNOSE)
9737    6541:
9738    TEST373A:
9739            PO,     LOAD-ENUA(4777),                        !JAMUPPS GO HERE IN DCS
9740                    LOAD-ERROR(TEST373A),                   !ERROR DIRECTORY KEY
9741                    DCS-CTR(C7.),                           !COMPARE AT JAMUPP
9742            NEXT,   J/RETURN373A                            !
    (6541)  DCS[1.00.1.0.0.0]  BM[1000..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.010]
9743
9744    6562:
9745    RETURN373A:
9746            P3,     CSPD[00]←EMIT, RETURN/TEST373B,         !RETURN AFTER PROCESSING, TO NEXT TEST
9747            NEXT,   GOTO-PAGE(7),                           !JAMUPP ROUTINE EXPECTS RETURN ADDRESS IN CSP(00)
9748                    J/SETIR373A                             !
    (6562)  DCS[0.00.0.0.0.0]  BM[0110..10.10..11.11..010..111...0.0.0..0..0...0.1111...1..0000.0...11.100...000.011.100]
9749
9750    7034:  !(FREE)
9751    SETIR373A:
9752            P2-U,   IR←EMIT, EMIT/000002,                   !SET DF=(2) IN IR
9753            P3,     BUTA(DIAGNOSE),                         !BEGIN THE TRANSFER SEQUENCE
9754            NEXT,   J/SETSR373A                             !
    (7034)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..010...0.0.0..0..0...1.1010...0..0000.0...11.011...000.011.111]
9755
9756    7037:  !(FREE)
9757    SETSR373A:
9758            P2-T,   SR←CSPD(C052525),                       !SET SR<00>=(1) FOR JAMUPP EXPECTED (BY JAMUPP SERVICER)
9759            NEXT,   GOTO-PAGE(3),                           !SET PAGE TO BE ACTUAL (3)
9760                    J/MED25                                 !POINT UPF TO B.M. DISP. ON PAGE
    (7037)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..011...0.0.1..0..0...0.0111...0..0000.0...11.100...000.010.000]
9761
9762    !THE SEQUENCE OF CONTROL SHOULD NOW BE COMING FROM THE B.M.:
```

```
9763
9764    !3020:
9765    !MED25:
9766    !       NEXT,   GOTO-PAGE(2),                           !XFER
9767    !               J/MED25A                                !
9768    !
9769    !2071:
9770    !MED25A:
9771    !       P2-T,   D←ASPHI[DF]-TOP, SAVE-D[C],             !READ FROM ASPHI/DF, WITH FLPADR ASSERTED
9772    !                                                       !SINCE DF=(2), THE SPADDRS=(12) WILL BE FORCED
9773    !       P3,     BUTA(DIAGNOSE),                         !ALSO START TO RETURN XFER TO DCS, VIA JAMUPP
9774    !       NEXT,   J/MED19A                                !
9775    !
9776    !2066:
9777    !MED19A:
9778    !       NEXT,   GOTO-PAGE(3),                           !THIS WORD ALSO GETS EXECUTED
9779    !               J/MED19                                 !BUT NOW JAMUPP GETS FORCED, AND WE GO NO FURTHER
9780    !
9781    !*** CONTROL NOW COMES BACK TO DCS JAMUPP POINT ***
9782    !
9783    !4777:
9784    !JAMUPP001:
9785    !       P3-T,   SR←D,                                   !SAVE OLD D IN SR
9786    !       NEXT,   BUTR(SR00),                             !TEST SR<00>:
9787    !                                                       !IF=(0), NOT-EXPECTED JAM, GOTO(JAMUPP003), (SEE JAMUPP ROUTINE)
9788    !               J/JAMUPP003                             !IF=(1), EXPECTED JAM, GOTO(JAMUPP002B)
9789    !
9790    !* COME HERE FOR EXPECTED JAM *
9791    !4757:
9792    !JAMUPP002B:
9793    !       P2-T,   D←CSPD(000), SAVE-D[C],                 !GET RETURN ADDRESS, STORED IN CSP(00)
9794    !       NEXT,   J/JAMUPP002C                            !
9795    !
9796    !=[4000:4777]
9797    !JAMUPP002C:
9798    !       P0,     RETURN←D[14-03], PAGE(7),               !PUT RETURN ADDRESS INTO RETURN REGISTER
9799    !       P2-T,   D←SR, SAVE-D[C],                        !RESTORE OLD D
9800    !       NEXT,   J/JAMUPP002D                            !
9801    !
9802    !=[7000:7377]
9803    !JAMUPP002D:
9804    !       P2-T,   SR←ZERO,                                !ZERO OUT SR<00>, FURTHER JAMUPPS NOW ILLEGAL
9805    !       NEXT,   BUTA(RETURN),                           !AND RETURN TO FLOWS
9806    !               J/BUTERROR7                             !ONLY IF ERROR
9807    !
9808
9809    !AT THIS POINT, CONTROL SHOULD NOW RETURN TO THIS POINT; THE NEXT TEST
9810    !THIS TEST NOW CHECKS TO SEE THAT THE B.M. FUNCTION WAS EXECUTED CORRECTLY
9811    !NOTE THAT IN TEST-350 ( A WHILE BACK ), A←BSPHI[12] WERE LOADED WITH (000152) DATA
9812
9813    6572:
9814    TEST373B:
9815            P0,     LOAD-ENUA(ZTARGET425),                  !FOR INSTRS-E78-(425) DECODE
9816                    LOAD-ERROR(TEST373B),                   !ERROR DIRECTORY KEY
```

```
9817                    DCS-CTR(C6.),                                   !COMPARE AT TARGET
9818            NEXT,   J/GOBUT3738                                     !
     (6572)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..010..101...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.001]
9819
9820    6101:  !(FREE)
9821    GOBUT3738:
9822            SETUP,  RETURN/SCOPE373,                                !RETURN TO SCOPE LOOP TEST WORD
9823            NEXT,   CALL[DINTOIR-5]                                 !GO DO D -> DBUF -> IR, BUT(INSTRS)
     (6101)  DCS[0.00.0.0.0.0]  BM[0110..00.00..10.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
9824
9825
9826
9827    6102:  !(FREE)
9828    SCOPE373:
9829            PO,     BUMP-VERIFY,                                    !COUNT
9830            NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "TEST374"  (+1. WORDS)
9831                    J/TEST374                                       !   ERROR:  "RETURN373A"  (-12. WORDS)
     (6102)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.011]
9832
9833
9834
9835
9836
9837    !.PAGE==========================================================================================================
9838
9839
9840    .TOC    *   TEST374:  A/B SP REWRITE MODES VERIFICATION
9841
9842
9843    !*************************************************************************************************
9844    !*
9845    !*      TESTS:  374 A - F                                       UWORDS:  076 + 336
9846    !*
9847    !*      FUNCTIONS:
9848    !*
9849    !*      THE FOLLOWING GROUP OF TWELVE TESTS PERFORMS A VERIFICATION OF THE A/B SP REWRITE
9850    !*      FUNCTIONS:
9851    !*
9852    !*              WR(A,L,A)       WR(A,L,B)       WR(A,H,A)       WR(A,H,B)
9853    !*              WR(B,L,A)       WR(B,L,B)       WR(B,H,A)       WR(B,H,B)
9854    !*              WR(AB,L,A)      WR(AB,L,B)      WR(AB,H,A)      WR(AB,H,B)
9855    !*
9856    !*      EACH FUNCTION IS INVOKED, AND THE RESULTANT SCRATCHPADS ARE CHECKED TO INSURE
9857    !*      THAT (1) ONLY THE RIGHT SCRATCHPADS WERE WRITTEN, AND (2) THE CORRECT ADDRESS
9858    !*      WAS USED FOR THE REWRITE.
9859    !*
9860    !*************************************************************************************************
9861
9862    !
9863    !       SUMMARY OF ASP/BSP HI/LO REWRITE FUNCTIONALITY TESTS:
9864    !
9865    !                                               --DF---  --SF---
9866    !       TEST  REWRITE--FUNCTION   ASP   BSP     ASP BSP  ASP BSP  SR IN
```

```
9867    !      NUMB  A/B  HI/LO  A/B-ADR   ADDR  ADDR   H-L H-L  H-L H-L  OCTAL
9868    !      ----  ---  -----  -------   ----  ----   - - - -  - - - -  ------
9869    !
9870    !       A1    A    LO     A-ADDR    SF/4  DF/2   0 0 0 0  0 1 0 0  002100
9871    !       A2    "    "      B-ADDR    "     "      0 1 0 0  0 0 0 0
9872    !
9873    !       B1    A    HI     A-ADDR    DF/2  SF/4   1 0 0 0  0 0 0 0  100010
9874    !       B2    "    "      B-ADDR    "     "      0 0 0 0  1 0 0 0
9875    !
9876    !       C1    B    LO     A-ADDR    DF/4  SF/2   0 0 0 1  0 0 0 0  010001
9877    !       C2    "    "      B-ADDR    "     "      0 0 0 0  0 0 0 1
9878    !
9879    !       D1    B    HI     A-ADDR    SF/2  DF/4   0 0 0 0  0 0 1 0  001040
9880    !       D2    "    "      B-ADDR    "     "      0 0 1 0  0 0 0 0
9881    !
9882    !       E1    AB   LO     A-ADDR    SF/4  DF/2   0 0 0 0  0 1 0 1  002520
9883    !       E2    "    "      B-ADDR    "     "      0 1 0 1  0 0 0 0
9884    !
9885    !       F1    AB   HI     A-ADDR    DF/4  SF/2   1 0 1 0  0 0 0 0  120012
9886    !       F2    "    "      B-ADDR    "     "      0 0 0 0  1 0 1 0
9887    !
9888
9889
9890
9891
9892
9893    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
9894
9895    !*** TEST 374A ***
9896
9897    6563:
9898    TEST374:
9899            P0,     BUMP-VERIFY,                            !COUNT
9900                    LOAD-ERROR(TEST374),                    !ERROR DIRECTORY KEY
9901            P3,     CSPD[01]←EMIT,                          !CONSTANT FOR:
9902            EMITC,  SR-LEFT, GUARD-DIS,                     !SETUP RES FOR SR FUNCTION
9903                    EMIT07/1,                               !FLAG BIT FOR TESTING
9904            NEXT,   J/LOADRES374                            !
    (6563)  DCS[1.00.0.0.0.1]  BM[0001..10.00..00.10..000..000...0.0.0..0..0...0.1110...1..0000.0...11.000...001.000.011]
9905
9906    6103:  !(FREE)
9907    LOADRES374:
9908            P0,     DCS-CTR(C15.),                          !HOLD UP ERROR COUNTER
9909            P2,     RES←CSPD(D01),                          !SR NOW SETUP
9910            NEXT,   GOTO-PAGE(5),                           !XFR
9911                    J/EXPEC374A1                            !
    (6103)  DCS[0.00.1.0.0.0]  BM[0000..10.00..00.00..000..101...0.0.0..0..0...0.1110...0..1000.1...11.100...010.010.010]
9912
9913    5222:  !(FREE)
9914    EXPEC374A1:
9915            P3,     CSPD[02]←EMIT, EMIT/002100,             !EXPECTED "SERIAL" REPRESENTATION OF RESULT
9916            NEXT,   J/ZER0374A1                             !
    (5222)  DCS[0.00.0.0.0.0]  BM[0000..10.01..00.01..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.011.110]
```

```
9917
9918    5536:
9919    ZERO374A1:
9920            PO,     BUMP-VERIFY,                                    !COUNT
9921            SETUP,  RETURN/DOWRITE374A1,                            !EXEC SUBR WHICH:
9922                                                                    !(1) (000402) -> IR,
9923            NEXT,   CALL[ZEROSF04DF02]                              !(2)  WRITES ZEROES TO A/B SP HI/LO SF/DF
     (5536)  DCS[0.00.0.0.0.1]  BM[0101..00.01..00.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]
9924
9925    5225:  !(FREE)
9926    DOWRITE374A1:
9927            P2-T,   D←CSPD(D01), D[C]←0,                            !DATA WITH BIT<07> SET
9928                    ASP-ADDRS-R[SF],                                !ADDRESS ASP WITH SF MODE
9929                    BSP-ADDRS-R[DF],                                !ADDRESS BSP WITH DF MODE
9930            P3,     WR(A,LO,A-ADDR),                                !SELECT THE PARTICULAR FUNCTION TO TEST,
9931            NEXT,   J/GETTEM374A1                                   !  USING A-ADDR FOR REWRITE
     (5225)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..0001.0...11.000...010.010.110]
9932
9933    5226:  !(FREE)
9934    GETTEM374A1:
9935            P3,     CSPD[00]←EMIT, RETURN/ZERO374A2,                !(SEE DESCRIP OF SUBR FOR FUNCTION)
9936            NEXT,   CALL[SFDFTOSR]                                  !
     (5226)  DCS[0.00.0.0.0.0]  BM[0101..10.01..00.10..111..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
9937
9938
9939
9940    5227:  !(FREE)
9941    ZERO374A2:
9942            SETUP,  RETURN/DOWRITE374A2,                            !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
9943            NEXT,   CALL[ZEROSF04DF02]                              !
     (5227)  DCS[0.00.0.0.0.0]  BM[0101..00.01..00.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]
9944
9945    5230:  !(FREE)
9946    DOWRITE374A2:
9947            P2-T,   D←CSPD(D01), D[C]←0,                            !DATA WITH BIT<07> SET
9948                    ASP-ADDRS-R[SF],                                !ADDRESS ASP WITH SF MODE
9949                    BSP-ADDRS-R[DF],                                !ADDRESS BSP WITH DF MODE
9950            P3,     WR(A,LO,B-ADDR),                                !USE SAME FUNCTION AS ABOVE,
9951            NEXT,   J/GETTEM374A2                                   !  ONLY USE B-ADDR FOR REWRITE THIS TIME
     (5230)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..0101.0...11.000...010.011.001]
9952
9953    5231:  !(FREE)
9954    GETTEM374A2:
9955            P3,     CSPD[00]←EMIT, RETURN/TEST374A2,                !(SEE DESCRIP OF SUBR FOR FUNCTION)
9956            NEXT,   CALL[SFDFTOSR]                                  !
     (5231)  DCS[0.00.0.0.0.0]  BM[0101..10.11..00.00..100..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
9957
9958    5604:
9959    TEST374A2:
9960            PO,     LOAD-ENUA(ZTARGET434),                          !NOW SETUP FOR IR=ZERO COMPARE
9961                    LOAD-ERROR(TEST374A2),                          !ERROR DIRECTORY KEY
9962                    DCS-CTR(C6.),                                   !COMPARE AT TARGET
```

```
9963                    BUMP-VERIFY,                                    !COUNT
9964            NEXT,   J/GOTEST374A2                                   !
     (5604)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.010]
9965
9966    5232:   !(FREE)
9967    GOTEST374A2:
9968            SETUP,  RETURN/SCOPE374A,                               !GO EXEC SUBR THAT:
9969            NEXT,   CALL[DINTOIR-5]                                 !  PUTS D -> IR, BUT(INSTRS) TO TEST FOR ZERO
     (5232)  DCS[0.00.0.0.0.0]  BM[0101..00.01..00.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
9970
9971
9972
9973
9974    5233:   !(FREE)
9975    SCOPE374A:
9976            NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "EXPEC374B1" (+1. WORDS)
9977                    J/EXPEC374B1                                    !   ERROR:  "ZER0374A1" (-8. WORDS)
     (5233)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.111]
9978
9979
9980
9981
9982    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
9983
9984    !*** TEST 374B ***
9985
9986    5537:
9987    EXPEC374B1:
9988            P3,     CSPD[02]←EMIT, EMIT/100010,                     !EXPECTED "SERIAL" REPRESENTATION OF RESULT
9989            NEXT,   J/ZER0374B1                                     !
     (5537)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.00..001..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.101.110]
9990
9991    5556:
9992    ZER0374B1:
9993            P0,     BUMP-VERIFY,                                    !COUNT
9994            SETUP,  RETURN/DOWRITE374B1,                            !EXEC SUBR WHICH:
9995                                                                    !(1) (000402) -> IR,
9996            NEXT,   CALL[ZEROSF04DF02]                              !(2)  WRITES ZEROES TO A/B SP HI/LO SF/DF
     (5556)  DCS[0.00.0.0.0.1]  BM[0101..00.01..00.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]
9997
9998    5234:   !(FREE)
9999    DOWRITE374B1:
10000           P2-T,   D←CSPD(D01), D[C]←0,                            !DATA WITH BIT<07> SET
10001                   ASP-ADDRS-R[DF],                                !ADDRESS ASP WITH DF MODE
10002                   BSP-ADDRS-R[SF],                                !ADDRESS BSP WITH SF MODE
10003           P3,     WR(A,HI,A-ADDR),                                !SELECT THE PARTICULAR FUNCTION TO TEST,
10004           NEXT,   J/GETTEM374B1                                   !  USING A-ADDR FOR REWRITE
     (5234)  DCS[0.00.0.0.0.0]  BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..1001.0...11.000...010.011.101]
10005
10006   5235:   !(FREE)
10007   GETTEM374B1:
10008           P3,     CSPD[00]←EMIT, RETURN/ZER0374B2,                !(SEE DESCRIP OF SUBR FOR FUNCTION)
```

```
10009            NEXT,   CALL[SFDFTOSR]                                  !
     (5235)  DCS[0.00.0.0.0.0]  BM[0101..10.01..00.11..110..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
10010
10011
10012
10013    5236:  !(FREE)
10014    ZERO374B2:
10015            SETUP,  RETURN/DOWRITE374B2,                             !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
10016            NEXT,   CALL[ZEROSF04DF02]                              !
     (5236)  DCS[0.00.0.0.0.0]  BM[0101..00.01..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]
10017
10018    5237:  !(FREE)
10019    DOWRITE374B2:
10020            P2-T,   D←CSPD(D01), D[C]←0,                             !DATA WITH BIT<07> SET
10021                    ASP-ADDRS-R[DF],                                 !ADDRESS ASP WITH DF MODE
10022                    BSP-ADDRS-R[SF],                                 !ADDRESS BSP WITH SF MODE
10023            P3,     WR(A,HI,B-ADDR),                                 !USE SAME FUNCTION AS ABOVE,
10024            NEXT,   J/GETTEM374B2                                    !  ONLY USE B-ADDR FOR REWRITE THIS TIME
     (5237)  DCS[0.00.0.0.0.0]  BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..1101.0...11.000...010.100.000]
10025
10026    5240:  !(FREE)
10027    GETTEM374B2:
10028            P3,     CSPD[00]←EMIT, RETURN/TEST374B2,                 !(SEE DESCRIP OF SUBR FOR FUNCTION)
10029            NEXT,   CALL[SFDFTOSR]                                   !
     (5240)  DCS[0.00.0.0.0.0]  BM[0101..10.11..00.00..110..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
10030
10031    5606:
10032    TEST374B2:
10033            P0,     LOAD-ENUA(ZTARGET434),                           !NOW SETUP FOR IR=ZERO COMPARE
10034                    LOAD-ERROR(TEST374B2),                           !ERROR DIRECTORY KEY
10035                    DCS-CTR(C6.),                                    !COMPARE AT TARGET
10036                    BUMP-VERIFY,                                     !COUNT
10037            NEXT,   J/GOTEST374B2                                    !
     (5606)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.100.001]
10038
10039    5241:  !(FREE)
10040    GOTEST374B2:
10041            SETUP,  RETURN/SCOPE374B,                                !GO EXEC SUBR THAT:
10042            NEXT,   CALL[DINTOIR-5]                                  !  PUTS D -> IR, BUT(INSTR5) TO TEST FOR ZERO
     (5241)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
10043
10044
10045
10046
10047    5242:  !(FREE)
10048    SCOPE374B:
10049            NEXT,   BUTD[SCOPE],                                     !NO ERROR:  "EXPEC374C1" (+1. WORDS)
10050                    J/EXPEC374C1                                     !   ERROR:  "ZERO374B1" (-8. WORDS)
     (5242)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.101.111]
10051
10052
10053
```

```
10054
10055    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
10056
10057    !*** TEST 374C ***
10058
10059    5557:
10060    EXPEC374C1:
10061            P3,     CSPD[02]←EMIT, EMIT/010001,          !EXPECTED "SERIAL" REPRESENTATION OF RESULT
10062            NEXT,   J/ZER0374C1                          !
    (5557)  DCS[0.00.0.0.0.0]  BM[0001..10.00..00.00..000..001...0.0.0..0..0...0.1101...1..0000.0...11.000...101.110.110]
10063
10064    5566:
10065    ZER0374C1:
10066            P0,     BUMP-VERIFY,                         !COUNT
10067            SETUP,  RETURN/DOWRITE374C1,                 !EXEC SUBR WHICH:
10068                                                         !(1) (000204) -> IR,
10069            NEXT,   CALL[ZEROSF02DF04]                   !(2)  WRITES ZEROES TO A/B SP HI/LO SF/DF
    (5566)  DCS[0.00.0.0.0.1]  BM[0101..00.01..01.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]
10070
10071    5243:  !(FREE)
10072    DOWRITE374C1:
10073            P2-T,   D←CSPD(D01), D[C]←0,                 !DATA WITH BIT<07> SET
10074                    ASP-ADDRS-R[DF],                     !ADDRESS ASP WITH DF MODE
10075                    BSP-ADDRS-R[SF],                     !ADDRESS BSP WITH SF MODE
10076            P3,     WR(B,LO,A-ADDR),                     !SELECT THE PARTICULAR FUNCTION TO TEST,
10077            NEXT,   J/GETTEM374C1                        !  USING A-ADDR FOR REWRITE
    (5243)  DCS[0.00.0.0.0.0]  BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..0010.0...11.000...010.100.100]
10078
10079    5244:  !(FREE)
10080    GETTEM374C1:
10081            P3,     CSPD[00]←EMIT, RETURN/ZER0374C2,     !(SEE DESCRIP OF SUBR FOR FUNCTION)
10082            NEXT,   CALL[SFDFTOSR]                       !
    (5244)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.00..110..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
10083
10084
10085
10086    5246:  !(FREE)
10087    ZER0374C2:
10088            SETUP,  RETURN/DOWRITE374C2,                 !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
10089            NEXT,   CALL[ZEROSF02DF04]                   !
    (5246)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]
10090
10091    5247:  !(FREE)
10092    DOWRITE374C2:
10093            P2-T,   D←CSPD(D01), D[C]←0,                 !DATA WITH BIT<07> SET
10094                    ASP-ADDRS-R[DF],                     !ADDRESS ASP WITH DF MODE
10095                    BSP-ADDRS-R[SF],                     !ADDRESS BSP WITH SF MODE
10096            P3,     WR(B,LO,B-ADDR),                     !USE SAME FUNCTION AS ABOVE,
10097            NEXT,   J/GETTEM374C2                        !  ONLY USE B-ADDR FOR REWRITE THIS TIME
    (5247)  DCS[0.00.0.0.0.0]  BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..0110.0...11.000...010.101.000]
10098
10099    5250:  !(FREE)
```

```
10100    GETTEM374C2:
10101            P3,     CSPD[00]←EMIT, RETURN/TEST374C2,        !(SEE DESCRIP OF SUBR FOR FUNCTION)
10102            NEXT,   CALL[SFDFTOSR]                          !
     (5250)  DCS[0.00.0.0.0.0]  BM[0101..10.10..10.10..100..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
10103
10104    5524:
10105    TEST374C2:
10106            P0,     LOAD-ENUA(ZTARGET434),                  !NOW SETUP FOR IR=ZERO COMPARE
10107                    LOAD-ERROR(TEST374C2),                  !ERROR DIRECTORY KEY
10108                    DCS-CTR(C6.),                           !COMPARE AT TARGET
10109                    BUMP-VERIFY,                            !COUNT
10110            NEXT,   J/GOTEST374C2                           !
     (5524)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.001]
10111
10112    5251:  !(FREE)
10113    GOTEST374C2:
10114            SETUP,  RETURN/SCOPE374C,                       !GO EXEC SUBR THAT:
10115            NEXT,   CALL[DINTOIR-5]                         !  PUTS D -> IR, BUT(INSTRS) TO TEST FOR ZERO
     (5251)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
10116
10117
10118
10119
10120    5252:  !(FREE)
10121    SCOPE374C:
10122            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "EXPEC374D1" (+1. WORDS)
10123                    J/EXPEC374D1                            !   ERROR:  "ZER0374C1" (-8. WORDS)
     (5252)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.111]
10124
10125
10126
10127
10128    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
10129
10130    !*** TEST 374D ***
10131
10132    5567:
10133    EXPEC374D1:
10134            P3,     CSPD[02]←EMIT, EMIT/001040,             !EXPECTED "SERIAL" REPRESENTATION OF RESULT
10135            NEXT,   J/ZER0374D1                             !
     (5567)  DCS[0.00.0.0.0.0]  BM[0000..10.00..10.00..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.001.100]
10136
10137    5514:
10138    ZER0374D1:
10139            P0,     BUMP-VERIFY,                            !COUNT
10140            SETUP,  RETURN/DOWRITE374D1,                    !EXEC SUBR WHICH:
10141                                                            !(1) (000204) -> IR,
10142            NEXT,   CALL[ZEROSF02DF04]                      !(2)  WRITES ZEROES TO A/B SP HI/LO SF/DF
     (5514)  DCS[0.00.0.0.0.1]  BM[0101..00.01..01.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]
10143
10144    5253:  !(FREE)
10145    DOWRITE374D1:
```

```
10146            P2-T,    D←CSPD(D01), D[C]←0,                    !DATA WITH BIT<07> SET
10147                     ASP-ADDRS-R[SF],                         !ADDRESS ASP WITH SF MODE
10148                     BSP-ADDRS-R[DF],                         !ADDRESS BSP WITH DF MODE
10149            P3,      WR(B,HI,A-ADDR),                         !SELECT THE PARTICULAR FUNCTION TO TEST,
10150            NEXT,    J/GETTEM374D1                            !  USING A-ADDR FOR REWRITE
     (5253)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..1010.0...11.000...010.101.100]
10151
10152     5254:  !(FREE)
10153     GETTEM374D1:
10154            P3,      CSPD[00]←EMIT, RETURN/ZER0374D2,         !(SEE DESCRIP OF SUBR FOR FUNCTION)
10155            NEXT,    CALL[SFDFTOSR]                           !
     (5254)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..101..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
10156
10157
10158
10159     5255:  !(FREE)
10160     ZER0374D2:
10161            SETUP,   RETURN/DOWRITE374D2,                     !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
10162            NEXT,    CALL[ZEROSF02DF04]                       !
     (5255)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]
10163
10164     5256:  !(FREE)
10165     DOWRITE374D2:
10166            P2-T,    D←CSPD(D01), D[C]←0,                    !DATA WITH BIT<07> SET
10167                     ASP-ADDRS-R[SF],                         !ADDRESS ASP WITH SF MODE
10168                     BSP-ADDRS-R[DF],                         !ADDRESS BSP WITH DF MODE
10169            P3,      WR(B,HI,B-ADDR),                         !USE SAME FUNCTION AS ABOVE,
10170            NEXT,    J/GETTEM374D2                            !  ONLY USE B-ADDR FOR REWRITE THIS TIME
     (5256)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..1110.0...11.000...010.101.111]
10171
10172     5257:  !(FREE)
10173     GETTEM374D2:
10174            P3,      CSPD[00]←EMIT, RETURN/TEST374D2,         !(SEE DESCRIP OF SUBR FOR FUNCTION)
10175            NEXT,    CALL[SFDFTOSR]                           !
     (5257)  DCS[0.00.0.0.0.0]  BM[0101..10.10..10.00..000..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
10176
10177     5500:
10178     TEST374D2:
10179            P0,      LOAD-ENUA(ZTARGET434),                   !NOW SETUP FOR IR=ZERO COMPARE
10180                     LOAD-ERROR(TEST374D2),                   !ERROR DIRECTORY KEY
10181                     DCS-CTR(C6.),                            !COMPARE AT TARGET
10182                     BUMP-VERIFY,                             !COUNT
10183            NEXT,    J/GOTEST374D2                            !
     (5500)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.000]
10184
10185     5260:  !(FREE)
10186     GOTEST374D2:
10187            SETUP,   RETURN/SCOPE374D,                        !GO EXEC SUBR THAT:
10188            NEXT,    CALL[DINTOIR-5]                          !  PUTS D -> IR, BUT(INSTR5) TO TEST FOR ZERO
     (5260)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
10189
10190
```

```
10191
10192
10193    5261:  !(FREE)
10194    SCOPE374D:
10195            NEXT,   BUTD[SCOPE],                          !NO ERROR:  "EXPEC374E1" (+1. WORDS)
10196                    J/EXPEC374E1                          !   ERROR:  "ZERO374D1" (-8. WORDS)
     (5261)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.101]
10197
10198
10199
10200
10201    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
10202
10203    !*** TEST 374E ***
10204
10205    5515:
10206    EXPEC374E1:
10207            P3,     CSPD[02]←EMIT, EMIT/002520,           !EXPECTED "SERIAL" REPRESENTATION OF RESULT
10208            NEXT,   J/ZERO374E1                           !
     (5515)  DCS[0.00.0.0.0.0]  BM[0000..10.01..01.01..010..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.010.110]
10209
10210    5526:
10211    ZERO374E1:
10212            P0,     BUMP-VERIFY,                          !COUNT
10213            SETUP,  RETURN/DOWRITE374E1,                  !EXEC SUBR WHICH:
10214                                                          !(1) (000402) -> IR,
10215            NEXT,   CALL[ZEROSF04DF02]                    !(2)  WRITES ZEROES TO A/B SP HI/LO SF/DF
     (5526)  DCS[0.00.0.0.0.1]  BM[0101..00.01..01.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]
10216
10217    5262:  !(FREE)
10218    DOWRITE374E1:
10219            P2-T,   D←CSPD(D01), D[C]←0,                  !DATA WITH BIT<07> SET
10220                    ASP-ADDRS-R[SF],                      !ADDRESS ASP WITH SF MODE
10221                    BSP-ADDRS-R[DF],                      !ADDRESS BSP WITH DF MODE
10222            P3,     WR(AB,LO,A-ADDR),                     !SELECT THE PARTICULAR FUNCTION TO TEST,
10223            NEXT,   J/GETTEM374E1                         !  USING A-ADDR FOR REWRITE
     (5262)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..0011.0...11.000...010.110.011]
10224
10225    5263:  !(FREE)
10226    GETTEM374E1:
10227            P3,     CSPD[00]←EMIT, RETURN/ZERO374E2,      !(SEE DESCRIP OF SUBR FOR FUNCTION)
10228            NEXT,   CALL[SFDFTOSR]                        !
     (5263)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.10..100..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
10229
10230
10231
10232    5264:  !(FREE)
10233    ZERO374E2:
10234            SETUP,  RETURN/DOWRITE374E2,                  !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
10235            NEXT,   CALL[ZEROSF04DF02]                    !
     (5264)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.001]
10236
```

```
10237    5265:  !(FREE)
10238    DOWRITE374E2:
10239            P2-T,   D←CSPD(D01), D[C]←0,                    !DATA WITH BIT<07> SET
10240                    ASP-ADDRS-R[SE],                        !ADDRESS ASP WITH SE MODE
10241                    BSP-ADDRS-R[DF],                        !ADDRESS BSP WITH DF MODE
10242            P3,     WR(AB,LO,B-ADDR),                       !USE SAME FUNCTION AS ABOVE,
10243            NEXT,   J/GETTEM374E2                           !  ONLY USE B-ADDR FOR REWRITE THIS TIME
    (5265)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.11..000..000...0.1.0..0..0...0.1110...0..0111.0...11.000...010.110.110]
10244
10245    5266:  !(FREE)
10246    GETTEM374E2:
10247            P3,     CSPD[00]←EMIT, RETURN/TEST374E2,        !(SEE DESCRIP OF SUBR FOR FUNCTION)
10248            NEXT,   CALL[SFDFTOSR]                          !
    (5266)  DCS[0.00.0.0.0.0]  BM[0101..10.10..10.00..010..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
10249
10250    5502:
10251    TEST374E2:
10252            P0,     LOAD-ENUA(ZTARGET434),                  !NOW SETUP FOR IR=ZERO COMPARE
10253                    LOAD-ERROR(TEST374E2),                  !ERROR DIRECTORY KEY
10254                    DCS-CTR(C6.),                           !COMPARE AT TARGET
10255                    BUMP-VERIFY,                            !COUNT
10256            NEXT,   J/GOTEST374E2                           !
    (5502)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.111]
10257
10258    5267:  !(FREE)
10259    GOTEST374E2:
10260            SETUP,  RETURN/SCOPE374E,                       !GO EXEC SUBR THAT:
10261            NEXT,   CALL[DINTOIR-5]                         !  PUTS D -> IR, BUT(INSTR5) TO TEST FOR ZERO
    (5267)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
10262
10263
10264
10265
10266    5270:  !(FREE)
10267    SCOPE374E:
10268            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "EXPEC374F1" (+1. WORDS)
10269                    J/EXPEC374F1                            !   ERROR:  "ZER0374E1" (-8. WORDS)
    (5270)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.111]
10270
10271
10272
10273
10274    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
10275
10276    !*** TEST 374F ***
10277
10278    5527:
10279    EXPEC374F1:
10280            P3,     CSPD[02]←EMIT, EMIT/120012,             !EXPECTED "SERIAL" REPRESENTATION OF RESULT
10281            NEXT,   J/ZER0374F1                             !
    (5527)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..001..010...0.0.0..0..0...0.1101...1..0000.0...11.000...101.001.110]
10282
10283    5516:
```

```
10284    ZER0374F1:
10285            P0,     BUMP-VERIFY,                          !COUNT
10286            SETUP,  RETURN/DOWRITE374F1,                  !EXEC SUBR WHICH:
10287                                                          !(1) (000204) -> IR,
10288            NEXT,   CALL[ZEROSF02DF04]                    !(2) WRITES ZEROES TO A/B SP HI/LO SF/DF
     (5516)  DCS[0.00.0.0.0.1]  BM[0101..00.01..01.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]
10289
10290    5271:  !(FREE)
10291    DOWRITE374F1:
10292            P2-T,   D←CSPD(D01), D[C]←0,                  !DATA WITH BIT<07> SET
10293                    ASP-ADDRS-R[DF],                      !ADDRESS ASP WITH DF MODE
10294                    BSP-ADDRS-R[SF],                      !ADDRESS BSP WITH SF MODE
10295            P3,     WR(AB,HI,A-ADDR),                     !SELECT THE PARTICULAR FUNCTION TO TEST,
10296            NEXT,   J/GETTEM374F1                         !  USING A-ADDR FOR REWRITE
     (5271)  DCS[0.00.0.0.0.0]  BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..1011.0...11.000...010.111.010]
10297
10298    5272:  !(FREE)
10299    GETTEM374F1:
10300            P3,     CSPD[00]←EMIT, RETURN/ZER0374F2,      !(SEE DESCRIP OF SUBR FOR FUNCTION)
10301            NEXT,   CALL[SFDFTOSR]                        !
     (5272)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.11..011..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
10302
10303
10304
10305    5273:  !(FREE)
10306    ZER0374F2:
10307            SETUP,  RETURN/DOWRITE374F2,                  !AGAIN GO WRITE ZEROES TO A/B-SP-HI/LO
10308            NEXT,   CALL[ZEROSF02DF04]                    !
     (5273)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.011.110]
10309
10310    5274:  !(FREE)
10311    DOWRITE374F2:
10312            P2-T,   D←CSPD(D01), D[C]←0,                  !DATA WITH BIT<07> SET
10313                    ASP-ADDRS-R[DF],                      !ADDRESS ASP WITH DF MODE
10314                    BSP-ADDRS-R[SF],                      !ADDRESS BSP WITH SF MODE
10315            P3,     WR(AB,HI,B-ADDR),                     !USE SAME FUNCTION AS ABOVE,
10316            NEXT,   J/GETTEM374F2                         !  ONLY USE B-ADDR FOR REWRITE THIS TIME
     (5274)  DCS[0.00.0.0.0.0]  BM[1010..10.01..00.10..000..000...0.1.0..0..0...0.1110...0..1111.0...11.000...010.111.101]
10317
10318    5275:  !(FREE)
10319    GETTEM374F2:
10320            P3,     CSPD[00]←EMIT, RETURN/TEST374F2,      !(SEE DESCRIP OF SUBR FOR FUNCTION)
10321            NEXT,   CALL[SFDFTOSR]                        !
     (5275)  DCS[0.00.0.0.0.0]  BM[0101..10.10..10.00..100..101...0.0.0..0..0...0.1111...1..0000.0...11.100...111.100.110]
10322
10323    5504:
10324    TEST374F2:
10325            P0,     LOAD-ENUA(ZTARGET434),                !NOW SETUP FOR IR=ZERO COMPARE
10326                    LOAD-ERROR(TEST374F2),                !ERROR DIRECTORY KEY
10327                    DCS-CTR(C6.),                         !COMPARE AT TARGET
10328                    BUMP-VERIFY,                          !COUNT
10329            NEXT,   J/GOTEST374F2                         !
```

```
      (5504)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.110]
10330
10331    5276:  !(FREE)
10332    GOTEST374F2:
10333           SETUP,  RETURN/SCOPE374F,                       !GO EXEC SUBR THAT:
10334           NEXT,   CALL[DINTOIR-5]                         !  PUTS D -> IR, BUT(INSTR5) TO TEST FOR ZERO
      (5276)  DCS[0.00.0.0.0.0]  BM[0101..00.01..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
10335
10336
10337
10338
10339    5277:  !(FREE)
10340    SCOPE374F:
10341           P2,     RES←CSPD(C000000),                      !RESET RES TO SR-LOAD/GUARD-DISABLED
10342           NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST3.5A" (+17. WORDS)
10343                   J/TEST375A                              !   ERROR:  "ZER0374F1" (-8. WORDS)
      (5277)  DCS[0.00.0.1.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.0100...0..1000.1...11.000...101.001.111]
10344
10345
10346
10347
10348    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
10349
10350    !       THE FOLLOWING SUBROUTINES ARE USED IN THE ABOVE TESTS (374 A1-F2):
10351    !
10352    !       THIS FIRST SUBROUTINE LOADS THE IR WITH THE APPROPRIATELY
10353    !               SELECTED SF AND DF FIELD VALUES, THEN PROCEEDS TO
10354    !               ZERO OUT THE ASP AND BSP LOCATIONS CORRESPONDING TO
10355    !               THESE VALUES, IN BOTH ASP/BSP HI/LO SP'S.
10356    !
10357    !               NOTE:  THIS SUBR MUST BE ENTERED WITH BUSDIN←EMIT AND
10358    !                       EN CLK IR PROC UCONS ENABLED
10359    !
10360    !               ALSO:  THE WRITE FUNCTION USED IS:   WR(AB,H,A) OR WR(AB,L,A)
10361    !                       WITH A-ADDR = SF OR DF, RESPECTIVELY
10362    !
10363
10364    7036:  !(FREE)
10365    ZEROSF02DF04:
10366           P2-U,   IR←EMIT, EMIT/000204,                   !SF=2, DF=4
10367           NEXT,   J/ZEROSFDF                              !GO ZERO
      (7036)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.10..000..100...0.0.0..0..0...1.1010...0..0000.0...11.000...000.100.010]
10368
10369    7041:  !(FREE)
10370    ZEROSF04DF02:
10371           P2-U,   IR←EMIT, EMIT/000402,                   !SF=4, DF=2
10372           NEXT,   J/ZEROSFDF                              !GO ZERO
      (7041)  DCS[0.00.0.0.0.0]  BM[0000..00.00..01.00..000..010...0.0.0..0..0...1.1010...0..0000.0...11.000...000.100.010]
10373
10374    7042:  !(FREE)
10375    ZEROSFDF:
10376           P2-T,   D←ZERO, SAVE-D[C],                      !ZEROES
10377           P3,     A#BSPHI[DF]←D,                          !
```

```
10378                   NEXT,   J/ZEROSFDFA                             !
     (7042)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.10..000..111...0.1.0..0..0...0.0000...0..1011.0...11.000...000.100.011]
10379
10380      7043:  !(FREE)
10381      ZEROSFDFA:
10382                   P3,     A=BSPLO[DF]+D,                          !
10383                   NEXT,   J/ZEROSF                                !
     (7043)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.10..000..000...0.0.0..0..0...0.0000...0..0011.0...11.000...000.100.100]
10384
10385      7044:  !(FREE)
10386      ZEROSF:
10387                   P2-T,   D+ZERO, SAVE-D[C],                      !ENTER HERE FOR SF ONLY
10388                   P3,     A=BSPHI[SF]+D,                          !
10389                   NEXT,   J/ZEROSFA                               !
     (7044)  DCS[0.00.0.0.0.0]  BM[0011..00.01..00.11..000..111...0.1.0..0..0...0.0000...0..1011.0...11.000...000.100.101]
10390
10391      7045:  !(FREE)
10392      ZEROSFA:
10393                   P3,     A=BSPLO[SF]+D,                          !
10394                   NEXT,   BUTA(RETURN),                           !AND RETURN
10395                           J/BUTERROR7                             !
     (7045)  DCS[0.00.0.0.0.0]  BM[0000..00.01..00.11..000..000...0.0.0..0..0...0.0000...0..0011.0...11.111...011.111.110]
10396
10397
10398
10399      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
10400
10401      !       THIS SECOND SUBROUTINE NOW READS BACK ALL THE REGISTERS IN ASP/BSP,
10402      !               HI/LO, SF/DF THAT THE WRITE COULD HAVE REFERENCED.
10403      !               IF LOCATION WAS WRITTEN, BIT<07> SHOULD BE SET,
10404      !               ELSE IT SHOULD REMAIN CLEAR (FROM ZEROSFXXDFXX ROUTINE)
10405      !               THE BITS ARE SHIFTED SERIALLY INTO THE SR, AND AFTER
10406      !               TWO WRITES (WHICH GIVES 16. BITS, THE SR JUST FILLED),
10407      !               THE COMPARE IS MADE BETWEEN EXPECTED:RECEIVED ANSWERS.
10408      !
10409      !               NOTE:  THIS SUBR REQUIRES SR-LEFT/GUARD-DISABLED SETUP,
10410      !                       AND CSP(02) CONTAINS EXPECTED ANSWER.
10411      !                       CSP(00) CONTAINS RETURN ADDRESS, IN BITS<14:03>.
10412      !
10413
10414      5746:
10415      SFDFTOSR:
10416                   P0,     LOAD-ENUA(ZTARGET777),                  !COMPARE POINT IS AT EXIT
10417                           LOAD-ERROR(SFDFTOSR),                   !THEORETICALLY THIS CODE SHOULD NEVER BE USED
10418                           DCS-CTR(C11.),                          !COMPARE AT TARGET
10419                   NEXT,   GOTO-PAGE(7),                           !SUBR IS HERE, NOTE OVERLAP W/ BIT<2:0> OF ENUA
10420                           J/SFDFTOSRAA                            !
     (5746)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.100.000]
10421
10422      7040:  !(FREE)
10423      SFDFTOSRAA:
10424                   P2-T,   D+ASPHI[DF], D[C]+ALU07,                !SR<15,07> = ASPHI/DF
10425                   NEXT,   J/SFDFTOSRA                             !
```

```
      (7040)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.10..000..011...0.1.0..0..0...0.0000...0..0000.0...11.000...000.100.111]
10426
10427    7047:  !(FREE)
10428    SFDFTOSRA:
10429           P2-T,   SR←SR-LEFT-1,                              !STORE PAST
10430                   D←ASPLO[DF],D[C]←ALU07,                    !SR<14,06> = ASPLO/DF
10431           NEXT,   J/SFDFTOSRB                                !
      (7047)  DCS[0.00.0.0.0.0]  BM[1111..00.00..10.10..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.000]
10432
10433    7050:  !(FREE)
10434    SFDFTOSRB:
10435           P2-T,   SR←SR-LEFT-1,                              !STORE PAST
10436                   D←BSPHI[DF],D[C]←ALU07,                    !SR<13,05> = BSPHI/DF
10437           NEXT,   J/SFDFTOSRC                                !
      (7050)  DCS[0.00.0.0.0.0]  BM[1010..01.00..00.00..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.001]
10438
10439    7051:  !(FREE)
10440    SFDFTOSRC:
10441           P2-T,   SR←SR-LEFT-1,                              !STORE PAST
10442                   D←BSPLO[DF],D[C]←ALU07,                    !SR<12,04> = BSPLO/DF
10443           NEXT,   J/SFDFTOSRD                                !
      (7051)  DCS[0.00.0.0.0.0]  BM[1010..00.00..00.00..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.010]
10444
10445    7052:  !(FREE)
10446    SFDFTOSRD:
10447           P2-T,   SR←SR-LEFT-1,                              !STORE PAST
10448                   D←ASPHI[SF],D[C]←ALU07,                    !SR<11,03> = ASPHI/SF
10449           NEXT,   J/SFDFTOSRE                                !
      (7052)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.11..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.011]
10450
10451    7053:  !(FREE)
10452    SFDFTOSRE:
10453           P2-T,   SR←SR-LEFT-1,                              !STORE PAST
10454                   D←ASPLO[SF],D[C]←ALU07,                    !SR<10,02> = ASPLO/SF
10455           NEXT,   J/SFDFTOSRF                                !
      (7053)  DCS[0.00.0.0.0.0]  BM[1111..00.00..10.11..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.100]
10456
10457    7054:  !(FREE)
10458    SFDFTOSRF:
10459           P2-T,   SR←SR-LEFT-1,                              !STORE PAST
10460                   D←BSPHI[SF],D[C]←ALU07,                    !SR<09,01> = BSPHI/SF
10461           NEXT,   J/SFDFTOSRG                                !
      (7054)  DCS[0.00.0.0.0.0]  BM[1010..01.01..00.00..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.101]
10462
10463    7055:  !(FREE)
10464    SFDFTOSRG:
10465           P2-T,   SR←SR-LEFT-1,                              !STORE PAST
10466                   D←BSPLO[SF],D[C]←ALU07,                    !SR<08,00> = BSPLO/SF
10467           NEXT,   J/SFDFTOSRH                                !
      (7055)  DCS[0.00.0.0.0.0]  BM[1010..00.01..00.00..000..011...0.1.1..0..0...0.0000...0..0000.0...11.000...000.101.110]
10468
10469    7056:  !(FREE)
10470    SFDFTOSRH:
10471           P2-T,   SR←SR-LEFT-1,                              !STORE PAST
```

```
10472                   D←CSPD(D00), D[C]←0,                    !RETRIEVE RETURN ADDRESS
10473             NEXT, J/SFDFTOSRI                             !
     (7056)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.1..0..0...0.1111...0..0000.0...11.000...000.101.111]
10474
10475     7057:  !(FREE)
10476     SFDFTOSRI:
10477             PO,   RETURN←D[14-03], PAGE(7),                !PUT RETURN ADDRESS INTO RETURN REGISTER,
10478             P2-T, D←SR-XOR-CSPD(D02), SAVE-D[C],           !COMPARE RECEIVED:EXPECTED
10479             NEXT, J/ZTARGET777                             !GO DO A BUTA(RETURN)
     (7057)  DCS[0.00.0.0.0.0]  BM[0110..10.00..00.00..000..111...0.1.0..0..0...0.1101...0..0000.0...11.101...111.111.111]
10480
10481
10482
10483
10484
10485     !.PAGE=============================================================================================================
10486
10487
10488     .TOC   *   TEST375-376:  BYTE WRITE TO ASP/BSP LO, SP ADDRS R-OR-1/FLTPT-INHIBIT
10489
10490
10491     !*****************************************************************************************
10492     !*
10493     !*     TESTS:  375A - 376                                UWORDS:  020 + 017
10494     !*
10495     !*     FUNCTIONS:
10496     !*
10497     !*     THE FOLLOWING SET OF THREE CHECKS TESTS THE FOLLOWING FEATURES OF THE ASP/BSP:
10498     !*
10499     !*     TEST 375 A/B TEST THAT BYTE WRITES CAN BE PERFORMED TO ASP/BSP LO, USING THE
10500     !*     "DAD" EXTENSION BIT COMBINATION.
10501     !*
10502     !*     TEST 376 VERIFIES THAT A FLOATING POINT INSTRUCTION IN THE IR FORCES SF-ADDRS
10503     !*     BIT<02> TO A (0), AND THAT BUTA(R-OR-1) IN THE REFERENCING MICROWORD FORCES
10504     !*     BIT<00> TO A (1).
10505     !*
10506     !*****************************************************************************************
10507
10508
10509
10510     !TEST 375 A CHECKS THAT THE DAD BIT COMBINATION /11 DOES A BYTE WRITE (IE, LO BYTE ONLY)
10511     5517:
10512     TEST375A:
10513             PO,   LOAD-EMUA(ZTARGET432),                   !SETUP FOR INSTRS IR=(000125)/E78/432
10514                   LOAD-ERROR(TEST375A),                    !ERROR DIRECTORY KEY
10515                   DCS-CTR(C11.),                           !COMPARE AT TARGET
10516             NEXT, J/SETSP375A                              !
     (5517)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.110]
10517
10518     5506:
10519     SETSP375A:
10520             P2-T, D←CSPD(C125252),                         !FIRST SETUP SP'S WITH JUNK
10521             P3,   A#BSPLO[06]←D-[A],                       !
10522             NEXT, GOTO-PAGE(7),                            !XFER FOR DCS-DAD BITS
```

```
10523                   J/FIRST375A                                     !
     (5506)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..111..111...0.1.0..0..0...0.0110...0..0011.0...11.100...000.100.110]
10524
10525     7046:  !(FREE)
10526     FIRST375A:
10527             SETUP,  FIRST-1-OR-2,                                   !DAD/01, SHOULDN'T CAUSE BYTE WRITE
10528             P2-T,   D←ZERO,                                         !SHOULD WRITE ALL ZEROES
10529             P3,     ASPLO[06]←D,                                    !
10530             NEXT,   J/SECOND375A                                    !
     (7046)  DCS[0.01.0.0.0.0]  BM[0011..00.00..00.00..111..000...0.1.0..0..0...0.0000...0..0001.0...11.000...000.110.001]
10531
10532     7061:  !(FREE)
10533     SECOND375A:
10534             SETUP,  SECOND-1-OR-2,                                  !DAD/10, SHOULDN'T CAUSE BYTE WRITE
10535             P2-T,   D←ZERO,                                         !SHOULD WRITE ALL ZEROES
10536             P3,     BSPLO[06]←D,                                    !
10537             NEXT,   J/BYTE375A                                      !
     (7061)  DCS[0.10.0.0.0.0]  BM[0011..00.10..00.00..111..000...0.1.0..0..0...0.0000...0..0110.0...11.000...000.110.010]
10538
10539     7062:  !(FREE)
10540     BYTE375A:
10541             SETUP,  BYTE-WRITE,                                     !DAD/11, SHOULD CAUSE A BYTE WRITE
10542             P2-T,   D←ASPHI(C052525),                               !WRITE THE (125) IN THE LOW BYTE
10543             P3,     A#BSPLO[06]←D-[B],                              !UPPER BYTE SHOULD BE (000) FROM ABOVE
10544             NEXT,   J/CHECK375A                                     !
     (7062)  DCS[0.11.0.0.0.0]  BM[1111..00.10..11.01..111..000...0.1.0..0..0...0.0000...0..0111.0...11.000...000.110.011]
10545
10546     7063:  !(FREE)
10547     CHECK375A:
10548             P2-T,   D←ASPLO(R06),                                   !GET THE A SIDE SP
10549             NEXT,   J/GOBUT375A                                     !
     (7063)  DCS[0.00.0.0.0.0]  BM[1111..00.00..10.00..111..000...0.1.0..0..0...0.0000...0..0000.0...11.000...000.110.100]
10550
10551     7064:  !(FREE)
10552     GOBUT375A:
10553             SETUP,  RETURN/TEST375B,                                 !RETURN TO START OF NEXT SUBTEST
10554             NEXT,   CALL[DINTOIR-5]                                 !GO CHECK (000125) OBTAINED
     (7064)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
10555
10556
10557
10558
10559
10560
10561     !TEST 375 B NOW CHECKS THE SAME THING (000125) IS ON THE B SIDE
10562     5625:
10563     TEST375B:
10564             P0,     LOAD-ENUA(ZTARGET432),                          !SETUP FOR INSTRS IR=(000125)/E78/432
10565                     LOAD-ERROR(TEST375B),                           !ERROR DIRECTORY KEY
10566                     DCS-CTR(C7.),                                   !COMPARE AT TARGET
10567             NEXT,   J/CHECK375B                                     !
     (5625)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.000.000]
10568
```

```
10569     5300:  !(FREE)
10570     CHECK375B:
10571            P2-T,   D←BSPL0(R06),                          !GET THE B SIDE SP
10572            NEXT,   J/GOBUT375B                            !
     (5300)  DCS[0.00.0.0.0.0]  BM[1010..00.10..00.00..111..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.000.001]
10573
10574     5301:  !(FREE)
10575     GOBUT375B:
10576            SETUP,  RETURN/TEST376A,                       !RETURN TO START OF NEXT SUBTEST
10577            NEXT,   CALL[DINTOIR-5]                        !GO CHECK (000125) OBTAINED
     (5301)  DCS[0.00.0.0.0.0]  BM[0101..00.10..10.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
10578
10579
10580
10581
10582
10583     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
10584
10585
10586     !TEST 376 A NOW DOES THE SF ADDRESS MODE, W/ FLTPT-INHIBIT AND BUTA(R-OR-1) ACTIVE
10587     !NOTE:
10588     !       THE ASPHI CONTAINS THE FOLLOWING VALUES IN THESE LOCATIONS:
10589     !
10590     !       ASPHI(02)       ASPHI(03)       ASPHI(06)       ASPHI(07)
10591     !       (052522)        (177777)        (056166)        (052525)
10592     !
10593
10594     5513:
10595     TEST376A:
10596            P0,     LOAD-ENUA(DOIT376A),                   !MAKE SURE BUTA(R-OR-1) DOESN'T CAUSE A BRANCH
10597                    LOAD-ERROR(TEST376A),                  !ERROR DIRECTORY KEY
10598                    DCS-CTR(C2.),                          !COMPARE AT TARGET
10599            NEXT,   J/SETIR376A                            !
     (5513)  DCS[1.00.1.0.0.0]  BM[1101..00.10..11.00..100..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.000.010]
10600
10601     5302:  !(FREE)
10602     SETIR376A:
10603            SETUP,  BUTA(R-OR-1),                          !SETUP ACTIVE BUT MODIFICATION OF SF BIT<00> ADDRESS
10604            P2-U,   IR←EMIT, EMIT/170600,                  !IR=FLTPT INSTR, SF=(6)
10605            NEXT,   J/DOIT376A                             !
     (5302)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.10..000..000...0.0.0..0..0...1.1010...0..0000.0...10.010...100.100.000]
10606
10607     5440:
10608     DOIT376A:
10609            P2-T,   D←A-XOR-B,                             !COMPARE SF/OBTAINED:REGISTER EXPECTED
10610                    BUS-A←ASPHI[SF],                       !SF ON A GOES FROM (6) -> (2) FROM FLTPT,
10611                                                           !AND FROM (2) -> (3) FOR (R-OR-1)
10612                    BUS-B←BSPHI(R03),                      !THIS WE EXPECT
10613            NEXT,   J/TEST376A1                            !
     (5440)  DCS[0.00.0.0.0.0]  BM[0110..01.11..11.11..101..000...0.1.0..0..0...0.0000...0..0000.0...11.000...110.001.100]
10614
10615     !     -     -     -     -     -     -     -     -     -     -     -
10616
```

```
10617     !NOW CHECK THE RIGHT RESULT WAS OBTAINED
10618     5614:
10619     TEST376A1:
10620             PO,     LOAD-ENUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTR5 COMPARE
10621                     LOAD-ERROR(TEST376A1),                  !ERROR DIRECTORY KEY
10622                     DCS-CTR(C6.),                           !COMPARE AT TARGET
10623             NEXT,   J/GOBUT376A                             !
      (5614)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...011.000.011]
10624
10625     5303:  !(FREE)
10626     GOBUT376A:
10627             SETUP,  RETURN/SCOPE376,                        !RETURN TO SCOPE LOOP TEST WORD
10628             NEXT,   CALL[DINTOIR-5]                         !CHECK FOR (000000)
      (5303)  DCS[0.00.0.0.0.0]  BM[0101..00.01..10.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
10629
10630
10631
10632     5304:  !(FREE)
10633     SCOPE376:
10634             PO,     BUMP-VERIFY,                            !COUNT
10635             NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST410"  (+1. WORDS)
10636                     J/TEST410                               !   ERROR:  "SETSP375A"  (-12. WORDS)
      (5304)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.111]
10637
10638
10639
10640
10641
10642     !.PAGE=========================================================================================================
10643
10644
10645     .TOC    *    TEST410:  BYTE/BYTE CONSTANT/D=ZERO
10646
10647
10648     !*************************************************************************************
10649     !*
10650     !*      TESTS:  410 A - E                                  UWORDS:  044 + 020
10651     !*
10652     !*      FUNCTIONS:
10653     !*
10654     !*      THE FOLLOWING TESTS RUN A COUNT PATTERN THRU THE IR, MAINTAING TOTALS OF
10655     !*      THE NUMBER OF TIMES:
10656     !*
10657     !*      BYTE-H=LOW, BYTE/1-OR-2-FIRST=HIGH, BYTE/1-OR-2-SECOND=HIGH,
10658     !*      (D=ZERO)-H=HIGH, AND (D=ZERO)-H=LOW.
10659     !*
10660     !*      AT THE END, THE TESTS COMPARE THE EXPECTED COUNTS TO THE RECEIVED COUNTS.
10661     !*
10662     !*************************************************************************************
10663
10664
10665     5507:
10666     TEST410:
```

```
10667            P0,     LOAD-ERROR(TEST410),                    !ERROR DIRECTORY KEY
10668                    DCS-CTR(C6.),                           !COMPARE BELOW
10669            NEXT,   GOTO-PAGE(6),                           !XFER
10670                    J/SETBYTEB410                           !
    (5507)  DCS[1.00.1.0.0.0]  BM[1001..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...101.110.000]
10671
10672    6560:
10673    SETBYTEB410:
10674            P2-T,   D←ZERO,                                 !ZEROES INTO:
10675            P3,     A#BSPHI[10]←D-[A],                      !ASPHI[10] = BYTE-FIRST
10676            NEXT,   GOTO-PAGE(7),                           !
10677                    J/SETBYTEC410                           !BSPHI[10] = WORD (=-BYTE)
    (6560)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..111...0.1.0..0..0...0.0000...0..1011.0...11.100...000.110.000]
10678
10679    7060:  !(FREE)
10680    SETBYTEC410:
10681            P3,     A#BSPLO[10]←D-[B],                      !ASPLO[10] = BYTE-SECOND
10682            NEXT,   J/SETBYTED410                           !BSPLO[10] = IR-DATA
    (7060)  DCS[0.00.0.0.0.0]  BM[0000..00.10..00.00..000..000...0.0.0..0..0...0.0000...0..0111.0...11.000...000.110.110]
10683
10684    7066:  !(FREE)
10685    SETBYTED410:
10686            P3,     A#BSPLO[11]←D-[B],                      !ASPLO[11] = D-NONZERO
10687            NEXT,   GOTO-PAGE(6),                           !BSPLO[11] = D-ZERO
10688                    J/SETBYTEE410                           !
    (7066)  DCS[0.00.0.0.0.0]  BM[0000..00.11..00.00..000..110...0.0.0..0..0...0.0000...0..0111.0...11.100...000.000.000]
10689
10690    6000:  !(FREE)
10691    SETBYTEE410:
10692            P0,     BUMP-VERIFY,                            !COUNT
10693            P3,     CSPD[17]←EMIT, EMIT/000001,             !A (1) IN BYTE-CONSTANT
10694            NEXT,   J/SETBYTEG410                           !  LOCATION IN CSP
    (6000)  DCS[0.00.0.0.0.1]  BM[0000..10.00..00.00..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...001.000.101]
10695
10696    6105:  !(FREE)
10697    SETBYTEG410:
10698            P2-U,   IR←DBUF-[I],                            !SETUP UCONS FOR D --> IR
10699            P3,     DBUF←D-[I],                             !
10700            NEXT,   J/TESTD410                              !
    (6105)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...111.111.011]
10701
10702
10703
10704    !*** LOOP BACK ENTRY POINT ***
10705
10706    6773:
10707    TESTD410:
10708            P0,     LOAD-ENUA(GOFOR410),                    !COMPARE AT END OF LOOP
10709                    LOAD-ERROR(TESTD410),                   !ERROR DIRECTORY KEY
10710                    DCS-CTR(C15.),                          !RELOAD EACH TIME THROUGH
10711            P2-U,   IR←DBUF,                                !(DON'T CARE HERE)
```

```
10712           P3,     DBUF←D,                                 !COPY IR-DATA FROM D --> DBUF
10713           NEXT,   BUTR(D14-00-EQ-0),                      !TEST D<14:00>H:
10714                   J/DNONZERO410                           !ZERO --> DZERO410, NONZERO --> DNONZERO410
    (6773)  DCS[1.00.1.0.0.0]  BM[0000..00.11..10.11..110..001...0.0.0..0..0...1.1010...0..0000.0...01.101...101.011.001]
10715
10716   !ENTER HERE IF D<14:00> WAS DETECTED AS NON-ZERO
10717   6531:
10718   DNONZERO410:
10719           P2-T,   D←ASPLO[DNONZERO]-PLUS-1,               !BUMP NON ZERO COUNTER
10720           P2-U,   IR←DBUF,                                !COPY IR-DATA FROM DBUF --> IR
10721           P3,     ASPLO[11]←D,                            !SAVE NON ZERO COUNTER
10722                   DBUF←D,                                 !(DON'T CARE HERE)
10723           NEXT,   GOTO-PAGE(7),                           !XFR TO 7 FOR DAD
10724                   J/NEXTPAT410                            !
    (6531)  DCS[0.00.0.0.0.0]  BM[1001..01.11..10.01..000..111...0.1.0..0..0...1.1010...0..0001.0...11.100...000.110.101]
10725
10726   !ENTER HERE IF D<14:00> WAS DETECTED AS ZERO
10727   6533:
10728   DZERO410:
10729           P2-T,   D←BSPLO[DZERO]-PLUS-1,                  !BUMP ZERO COUNTER
10730           P2-U,   IR←DBUF,                                !COPY IR-DATA FROM DBUF --> IR
10731           P3,     BSPLO[11]←D,                            !SAVE ZERO COUNTER
10732                   DBUF←D,                                 !(DON'T CARE NOW)
10733           NEXT,   GOTO-PAGE(7),                           !XFR TO 7 FOR DAD
10734                   J/NEXTPAT410                            !
    (6533)  DCS[0.00.0.0.0.0]  BM[1001..00.11..11.01..000..111...0.1.0..0..0...1.1010...0..0110.0...11.100...000.110.101]
10735
10736   7065:  !(FREE)
10737   NEXTPAT410:
10738           SETUP,  FIRST-1-OR-2,                           !SELECT DAD BITS FOR "BYTEFIRSTR410"
10739           P2-T,   D←BSPLO[IR-DATA]-PLUS-2,                !(INCRE DATA FOR -NEXT- TIME THRU)
10740                   D[C]←COUT15,                            !WHEN THIS SETS WE'RE DONE
10741           P3,     BSPLO[10]←D,                            !SAVE NEXT
10742           NEXT,   J/BYTEFIRST410                          !
    (7065)  DCS[0.01.0.0.0.0]  BM[1100..00.10..11.01..000..110...0.1.0..0..0...0.0000...0..0110.0...11.000...000.111.000]
10743
10744   7070:  !(FREE)
10745   BYTEFIRST410:
10746           SETUP,  SECOND-1-OR-2,                          !SELECT DAD BITS FOR "BYTESECOND410"
10747           P2-T,   D←ASPHI[BYTE-FIRST]-PLUS-CSP[1-0],      !BYTE-FIRST SELECTS EITHER
10748                   SAVE-D[C],                              !CSP(17)=1 OR CSP(13)=0
10749           P3,     ASPHI[10]←D,                            !WRITE BACK
10750           NEXT,   BUTR(BYTE),                             !BYTE --> "BYTESECOND410"
10751                   J/WORD410                               !-BYTE --> "WORD410
    (7070)  DCS[0.10.0.0.0.0]  BM[1001..10.00..11.00..000..111...0.1.0..0..0...0.0100...0..1001.0...01.001...011.110.110]
10752
10753   !ENTER HERE IF BYTE-H NOT ASSERTED, IE IR=(WORD)
10754   7366:
10755   WORD410:
10756           SETUP,  SECOND-1-OR-2,                          !SELECT DAD BITS FOR "BYTESECOND410"
10757           P2-T,   D←BSPHI[WORD]-PLUS-1,                   !BUMP WORD=-BYTE COUNTER
10758                   SAVE-D[C],                              !SAVE PAST CARRYOUT STATUS
```

```
10759           P3,     BSPHI[10]←D,                                    !WRITE BACK
10760           NEXT,   J/BYTESECOND410                                 !NOW GO TRY BYTE-SECOND
     (7366)  DCS[0.10.0.0.0.0]  BM[1001..01.10..11.01..000..111...0.1.0..0..0...0.0000...0..1110.0...11.000...011.110.111]
10761
10762     !ENTER HERE IF BYTE-H WAS ASSERTED, IE IR=(BYTE)
10763     7367:
10764     BYTESECOND410:
10765           SETUP,  NO-DAD,                                         !KEEP FOR NOISE
10766           P2-T,   D←ASPLO[BYTE-SECOND]-PLUS-CSP[1-0],             !BYTE-SECOND SELECTS EITHER
10767                   SAVE-D[C],                                      !CSP[17]=1 OR CSP[13]=0
10768           P3,     ASPLO[10]←D,                                    !WRITE BACK
10769           NEXT,   BUTR(D[C]-B),                                   !IF SET, SKIP OUT TO TEST-410A
10770                   J/GOFOR410                                      !IF CLEAR, FALL THRU TO  NEXT
     (7367)  DCS[0.00.0.0.0.0]  BM[1001..10.00..10.00..000..111...0.1.0..0..0...0.0100...0..0001.0...10.011...011.110.001]
10771
10772     7361:                                                         !01, P7
10773     GOFOR410:
10774           P2-T,   D←BSPLO[IR-DATA],                               !GET DATA FOR IR INTO D
10775           NEXT,   GOTO-PAGE(6),                                   !
10776                   J/TESTD410                                      !LOOP BACK FOR NEXT
     (7361)  DCS[0.00.0.0.0.0]  BM[1010..00.10..00.00..000..110...0.1.0..0..0...0.0000...0..0000.0...11.100...111.111.011]
10777
10778
10779
10780
10781     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
10782
10783     !TEST 410A CHECKS THAT D<14:00>=ZERO WAS ONLY ASSERTED TWICE
10784     7363:                                                         !11, P7
10785     EXPEC410A:
10786           NEXT,   GOTO-PAGE(6),                                   !FOR LOADING DCS-CTR
10787                   J/TEST410A                                      !
     (7363)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...111.001.001]
10788
10789     6711:
10790     TEST410A:
10791           P0,     LOAD-ENUA(ZTARGET422),                          !FOR IR=(000002) W/INSTR5
10792                   LOAD-ERROR(TEST410A),                           !ERROR DIRECTORY KEY
10793                   DCS-CTR(C7.),                                   !COMPARE AT TARGET
10794           NEXT,   J/COMP410A                                      !
     (6711)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..010..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.000.110]
10795
10796     6106:  !(FREE)
10797     COMP410A:
10798           P2-T,   D←BSPLO[DZERO],                                 !GET DATA
10799           NEXT,   J/INTOIR410A                                    !
     (6106)  DCS[0.00.0.0.0.0]  BM[1010..00.11..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...001.000.111]
10800
10801     6107:  !(FREE)
10802     INTOIR410A:
10803           SETUP,  RETURN/TEST410B,                                !COPY D --> IR, RESET BUSDIN←EMIT
10804           NEXT,   CALL[DINTOIR-5]                                 ! AND CHECK ITS ALL ZERO
```

```
      (6107)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
10805
10806
10807
10808
10809    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
10810
10811    !TEST 4108 CHECKS THAT D<14:00>=ZERO WAS NOT ASSERTED
10812    ! 32768.-2. = 32766. (077776) TIMES
10813    6704:
10814    TEST4108:
10815          P0,     LOAD-ENUA(ZTARGET434),                    !FOR IR=(000000) W/INSTRS
10816                  LOAD-ERROR(TEST4108),                     !ERROR DIRECTORY KEY
10817                  DCS-CTR(C8.),                             !COMPARE AT TARGET
10818                  BUMP-VERIFY,                              !COUNT
10819          NEXT,   J/EXPEC4108                               !
      (6704)  DCS[1.00.1.0.0.1]  BM[0111..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.000]
10820
10821    6110:  !(FREE)
10822    EXPEC4108:
10823          P3,     CSPD[17]←EMIT, EMIT/077776,               !EXPECTED NUMBER OF TIMES
10824          NEXT,   J/COMP4108                                !D<14:00> WAS NON ZERO
      (6110)  DCS[0.00.0.0.0.0]  BM[0111..10.11..11.11..111..110...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.001]
10825
10826    6111:  !(FREE)
10827    COMP4108:
10828          P3-T,   D←ASPLO[DNONZERO]-MINUS-CSPD[17],         !COMPARE RECEIVED:EXPECTED
10829          NEXT,   J/GOPUT4108                               !
      (6111)  DCS[0.00.0.0.0.0]  BM[1101..10.00..10.01..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...001.001.010]
10830
10831    6112:  !(FREE)
10832    GOPUT4108:
10833          SETUP,  RETURN/TEST410C,                          !GO PUT D --> IR
10834          NEXT,   CALL[DINTOIR-5]                           !  AND CHECK IT-S ALL ZERO
      (6112)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
10835
10836
10837
10838
10839    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
10840
10841    !TEST 410C CHECKS THAT BYTE-H WAS NOT ASSERTED 21696.,
10842    !OR WAS ASSERTED 11072. TIMES IN 32768. ITERATIONS
10843    6707:
10844    TEST410C:
10845          P0,     LOAD-ENUA(ZTARGET402),                    !SETUP FOR D=ZERO TEST
10846                  LOAD-ERROR(TEST410C),                     !ERROR DIRECTORY KEY
10847                  DCS-CTR(C6.),                             !COMPARE AT TARGET
10848          NEXT,   J/EXPEC410C                               !
      (6707)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.011]
10849
10850    6113:  !(FREE)
```

```
10851    EXPEC410C:
10852            P3,     CSPD[17]←EMIT, EMIT/52300,                !32768.-#TIMES BYTE-H ASSERTED
10853            NEXT,   J/ASIDE410C                               !  21696.=(52300)
     (6113)  DCS[0.00.0.0.0.0]  BM[0101..10.01..00.11..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.100]
10854
10855    6114:  !(FREE)
10856    ASIDE410C:
10857            P2-T,   SR←CSPD(D17),                             !GET ONTO A-SIDE
10858            NEXT,   J/COMP410C                                !
     (6114)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...001.001.101]
10859
10860    6115:  !(FREE)
10861    COMP410C:
10862            P3-T,   D←SR-MINUS-BSPHI[WORD],                   !COMPARE EXPEC:RECEIVED
10863            NEXT,   J/GOBUT410C                               !
     (6115)  DCS[0.00.0.0.0.0]  BM[1101..01.10..00.00..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...001.001.110]
10864
10865    6116:  !(FREE)
10866    GOBUT410C:
10867            SETUP,  RETURN/TEST410D,                          !RETURN TO START OF NEXT SUBTEST
10868            NEXT,   GOTO-PAGE(7),                             !BUT TABLE
10869                    J/BUTD-IS-ZERO                            !GO CHECK EQUALITY
     (6116)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
10870
10871
10872
10873
10874    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
10875
10876    !TEST 410D CHECKS THAT BYTE-CONSTANT WAS ASSERTED (4270)=2232.
10877    !TIMES UNDER "FIRST-1-OR-2"
10878    6727:
10879    TEST410D:
10880            P0,     LOAD-ENUA(ZTARGET402),                    !SETUP FOR D=ZERO TEST
10881                    LOAD-ERROR(TEST410D),                     !ERROR DIRECTORY KEY
10882                    DCS-CTR(CS.),                             !COMPARE AT TARGET
10883            NEXT,   J/EXPEC410D                               !
     (6727)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.001.111]
10884
10885    6117:  !(FREE)
10886    EXPEC410D:
10887            P0,     BUMP-VERIFY,                              !COUNT
10888            P3,     CSPD[17]←EMIT,                            !
10889                    EMIT/004270,                              !(4270)=2232. TIMES FOR FIRST
10890            NEXT,   J/COMP410D                                !
     (6117)  DCS[0.00.0.0.0.1]  BM[0000..10.10..00.10..111..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.010.000]
10891
10892    6120:  !(FREE)
10893    COMP410D:
10894            P3-T,   D←ASPHI[BYTE-FIRST]-MINUS-CSPD[17],       !COMPARE RECEIVED:EXPEC
10895            NEXT,   J/GOBUT410D                               !
     (6120)  DCS[0.00.0.0.0.0]  BM[1101..10.00..11.00..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...001.010.001]
10896
```

```
10897    6121:  !(FREE)
10898    GOBUT410D:
10899            SETUP,  RETURN/TEST410E,                        !RETURN TO START OF NEXT SUBTEST
10900            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
10901                    J/BUTD-IS-ZERO                          !CHECK EQUALITY
     (6121)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
10902
10903
10904
10905
10906    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
10907
10908    !TEST 410E CHECKS THAT BYTE-CONSTANT WAS ASSERTED (3600)=1920.
10909    !TIMES UNDER "SECOND-1-OR-2"
10910    6705:
10911    TEST410E:
10912            P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
10913                    LOAD-ERROR(TEST410E),                   !ERROR DIRECTORY KEY
10914                    DCS-CTR(C5.),                           !COMPARE AT TARGET
10915            NEXT,   J/EXPEC410E                             !
     (6705)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.010.010]
10916
10917    6122:  !(FREE)
10918    EXPEC410E:
10919            P0,     BUMP-VERIFY,                            !COUNT
10920            P3,     CSPD[17]←EMIT,                          !
10921                    EMIT/003600,                            !(3600)=1920. TIMES FOR SECOND
10922            NEXT,   J/COMP410E                              !
     (6122)  DCS[0.00.0.0.0.1]  BM[0000..10.01..11.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.010.011]
10923
10924    6123:  !(FREE)
10925    COMP410E:
10926            P3-T,   D←ASPLO[BYTE-SECOND]-MINUS-CSPD[17],    !COMPARE RECEIVED:EXPEC
10927            NEXT,   J/GOBUT410E                             !
     (6123)  DCS[0.00.0.0.0.0]  BM[1101..10.00..10.00..000..000...1.1.0..0..0...0.0000...0..0000.0...11.000...001.010.100]
10928
10929    6124:  !(FREE)
10930    GOBUT410E:
10931            SETUP,  RETURN/SCOPE410,                        !RETURN TO SCOPE LOOP TEST WORD
10932            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
10933                    J/BUTD-IS-ZERO                          !CHECK EQUALITY
     (6124)  DCS[0.00.0.0.0.0]  BM[0110..00.00..10.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
10934
10935
10936    6125:  !(FREE)
10937    SCOPE410:
10938            P0,     BUSDIN←EMIT-[1],                        !RESET PROC UCON
10939                    EN-CLK-IR[15-00],                       !
10940            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST500" (+1. WORDS)
10941                    J/TEST500                               !   ERROR:  "SETBYTEB410" (-34. WORDS)
     (6125)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.110.001]
10942
```

```
10943
10944
10945
10946
10947
10948
10949   !.PAGE=========================================================================================================================
10950
10951
10952   !*** VERSION /V101A0/ ***
10953
10954   .TOC   *   TEST500:  PREFETCH/OVERLAP/SP DEFEAT
10955
10956   !*************************************************************************************************
10957   !*
10958   !*     TESTS:  500C - 500F                                    UWORDS: 034 + 013
10959   !*
10960   !*     FUNCTIONS:      TESTS 500C - 500F RUN PATTERNS THRU THE IR TO TEST
10961   !*                     THE PREFETCH/OVERLAP ROM & THE SP WRITE DEFEAT LOGIC.
10962   !*
10963   !*************************************************************************************************
10964
10965
10966
10967   6561:
10968   TEST500:
10969           P0,     LOAD-ENUA(SETFETCHG500),                !INTERMEDIATE COMPARE AT START OF LOOP
10970                   LOAD-ERROR(TEST500),                    !ERROR DIRECTORY KEY
10971                   DCS-CTR(CS.),                           !COMPARE AT TARGET
10972           NEXT,   J/SETFETCHB500                          !
    (6561)  DCS[1.00.1.0.0.0]  BM[1010..00.11..00.01..011..001...0.0.0..0..0...0.0000...0..0000.0...11.000...110.111.110]
10973
10974   6676:
10975   SETFETCHB500:
10976           P2-T,   D←ZERO, D[C]←ALU15,                     !ZERO
10977                   SR←ZERO,                                !TO FLAG JAMUPPS AS ILLEGAL -- KEEP ZERO THRU "TEST505"
10978           P3,     A#BSPLO[OVERLAP]←D,                     !ZERO OVERLAP -A, -B COUNTERS
10979           NEXT,   J/SETFETCHD500                          !
    (6676)  DCS[0.00.0.0.0.0]  BM[0011..00.00..10.00..000..100...0.1.1..0..0...0.0000...0..0011.0...11.000...001.010.110]
10980
10981   6126:  !(FREE)
10982   SETFETCHD500:
10983           P3,     A#BSPHI[PATTERN]←D,                     !ZERO PATTERN (A AND B)
10984           NEXT,   J/SETFETCHE500                          !
    (6126)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..011..000...0.0.0..0..0...0.0000...0..1011.0...11.000...001.010.111]
10985
10986   6127:  !(FREE)
10987   SETFETCHE500:
10988           P3,     A#BSPHI[PREFETCH]←D,                    !ZERO PREFETCH-A COUNTER, ALSO B SIDE
10989           NEXT,   J/SETFETCHF500                          !
    (6127)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.00..000..000...0.0.0..0..0...0.0000...0..1011.0...11.000...001.011.000]
10990
10991   6130:  !(FREE)
10992   SETFETCHF500:
```

```
10993            P0,     BUMP-VERIFY,                                !COUNT
10994            P3,     CSPD[17]←020010,                            !
10995            NEXT,   J/SETFETCHGS00                              !MASK CONSTANT FOR DATA PATTERN
     (6130)  DCS[0.00.0.0.0.1]  BM[0010..10.00..00.00..001..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.011.001]
10996
10997    6131:  !(FREE)
10998    SETFETCHGS00:
10999            P0,     BUMP-VERIFY,                                !COUNT
11000            P2-U,   IR←DBUF-[1],                                !SETUP THESE UCON'S,
11001            P3,     DBUF←D-[1],                                 !DON'T WORRY ABOUT EFFECT HERE
11002            NEXT,   J/TESTD500                                  !
     (6131)  DCS[0.00.0.0.0.1]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...110.111.001]
11003
11004
11005    !*** LOOP-BACK ENTRY POINT ***
11006
11007    6671:
11008    TESTD500:
11009            P0,     LOAD-ENUA(NEXTPAT500),                      !COMPARE POINT IN LOOP
11010                    LOAD-ERROR(TESTD500),                       !ERROR DIRECTORY KEY
11011                    DCS-CTR(C4.),                               !COMPARE AT TARGET
11012            P2-U,   IR←DBUF,                                    !JUST HAPPENS, DON'T CARE NOW
11013            P3,     DBUF←D,                                     !PUT PATTERN LEFT IN D INTO DBUF
11014            NEXT,   J/LOADIRS00                                 !
     (6671)  DCS[1.00.1.0.0.0]  BM[1011..00.11..00.11..111..111...0.0.0..0..0...1.1010...0..0000.0...11.000...001.011.010]
11015
11016    6132:  !(FREE)
11017    LOADIRS00:
11018            P2-U,   IR←DBUF,                                    !PUT PATTERN NOW IN DBUF TO IR
11019            P3,     DBUF←D,                                     !JUST HAPPENS, DON'T CARE NOW
11020            NEXT,   J/TESTINHBSPS00                             !
     (6132)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.011.011]
11021
11022    6133:  !(FREE)
11023    TESTINHBSPS00:
11024            P2-T,   D←BSPLO[OVERLAP]-PLUS-1,                    !GET BUMPED OVERLAP COUNT, B-SIDE
11025                    D[C]←D,                                     !
11026            P3,     BSPLO[OVERLAP]←D,                           !ONLY WRITTEN BACK IF
11027                    BUTA(INSTR-1),                              !"OVERLAP L" ASSERTED
11028            NEXT,   J/TESTINHASPS00                             !(BRANCH EFFECT OF BUT MASKED)
     (6133)  DCS[0.00.0.0.0.0]  BM[1001..00.10..11.01..000..000...0.1.0..0..0...0.0000...0..0110.0...00.110...111.111.111]
11029
11030    6777:
11031    TESTINHASPS00:
11032            P2-T,   D←ASPLO[OVERLAP]-PLUS-1,                    !GET BUMPED OVERLAP COUNT, A-SIDE
11033                    SAVE-D[C],                                  !
11034            P3,     ASPLO[OVERLAP]←D,                           !ONLY WRITTEN BACK IF
11035                    BUTA(INSTR-1),                              !  "OVERLAP L" ASSERTED
11036            NEXT,   J/NEXTPAT500                                !(BRANCH EFFECT OF BUT MASKED)
     (6777)  DCS[0.00.0.0.0.0]  BM[1001..01.11..10.00..000..111...0.1.0..0..0...0.0000...0..0001.0...00.110...011.111.111]
11037
11038    6377:
11039    NEXTPAT500:
11040            P2-T,   D←ASPHI[PATTERN]-PLUS-020010-PLUS-1,        !GET NEXT DATA PATTERN IN D
```

```
11041                   D[C]←COUT15,                            !GET D[C]=OVERFLOW OUT OF BIT<15>
11042           P3,     A#BSPHI[PATTERN]←D,                     !WRITE BACK UNMASKED NEXT PATTERN
11043           NEXT,   BUTR(PREFETCH-L),                       !IF ASSERTED, "ASSERTF0V500"
11044                   J/ASSERTF0V500                          !OTHERWISE, "FIXPAT500"
     (6377)  DCS[0.00.0.0.0.0]  BM[1100..11.00..11.01..011..110...0.1.0..0..0...0.0000...0..1011.0...10.000...101.010.101]
11045
11046   !ENTER HERE IF "PREFETCH-L" WAS ASSERTED, LOW
11047   6525:
11048   ASSERTF0V500:
11049           P2-T,   D←ASPHI[PREFETCH]-PLUS-1,               !"PREFETCH(0)H" ASSERTED, BUMP COUNT
11050                   SAVE-D[C],                              !(SAVE CARRYOUT)
11051           P3,     ASPHI[PREFETCH]←D,                      !
11052           NEXT,   J/FIXPAT500                             !
     (6525)  DCS[0.00.0.0.0.0]  BM[1001..01.11..11.00..000..111...0.1.0..0..0...0.0000...0..1001.0...11.000...101.010.111]
11053
11054   !ENTER HERE IF "PREFETCH-L" WAS NOT ASSERTED, HIGH
11055   6527:
11056   FIXPAT500:
11057           P2-T,   D←ASPHI[PATTERN]-AND-NOT-020010,        !CLEAR UNNEEDED BITS
11058                   SAVE-D[C],                              !KEEP D[C] CONSTANT FOR "BUT"
11059           P3,     A#BSPHI[PATTERN]←D,                     !RESTORE PATTERN, ALSO LEAVE IN D
11060           NEXT,   BUTR(D[C]-B),                           !TEST CARRYOUT:
11061                   J/TESTD500                              !IF CLEAR, NEXT PATTERN AT: "TESTD500" (-6.WORDS)
     (6527)  DCS[0.00.0.0.0.0]  BM[0111..11.00..11.01..011..111...0.1.0..0..0...0.0000...0..1011.0...10.011...110.111.001]
11062                                                           !IF SET, EXIT LOOP TO: "TEST500A" (+1. WORD)
11063
11064
11065   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11066
11067   !*** TEST 500A ***
11068   !CHECK THAT REGISTER OPPOSITE ASPHI[PREFETCH], IN BSPHI, STILL ZERO
11069   6673:
11070   TEST500A:
11071           P0,     LOAD-EMUA(ZTARGET434),                  !SETUP FOR IR=(000000)/INSTR5 TEST
11072                   LOAD-ERROR(TEST500A),                   !ERROR DIRECTORY KEY
11073                   DCS-CTR(C7.),                           !COMPARE AT TARGET
11074                   BUMP-VERIFY,                            !COUNT
11075           NEXT,   J/COMP500A                              !
     (6673)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.100]
11076
11077   6134:  !(FREE)
11078   COMP500A:
11079           P2-T,   D←BSPHI[PREFETCH],                      !GET REGISTER
11080                   SAVE-D[C],                              !
11081           NEXT,   J/GOBUT500A                             !
     (6134)  DCS[0.00.0.0.0.0]  BM[1010..01.10..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...001.011.101]
11082
11083   6135:  !(FREE)
11084   GOBUT500A:
11085           P0,     BUMP-VERIFY,                            !COUNT
11086           SETUP,  RETURN/TEST500C,                        !RETURN TO START OF NEXT SUBTEST
11087           NEXT,   CALL[DINTOIR-5]                         !PUT D -> DBUF -> IR, DO INSTR5 BUT FOR (000000)
     (6135)  DCS[0.00.0.0.0.1]  BM[0110..00.11..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
```

```
                                                                        !
                                                                        !*** ALSO SETS UP BUSDIN <- EMIT UPON EXIT ***
                                                                        !
                                                                        !
                                                                        !
                                                                        !
                                                                        !
    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
    !
    !*** TEST 500C ***
    !CHECK THAT ASSERTING "OVERLAP L" ONLY ALLOWED A SP REWRITE (DURING
    !A BUT[INSTR-1]) IN ASPLO 4005. TIMES / 16384. DATA PATTERNS
    6726:
    TEST500C:
            P0,     LOAD-EMUA(ZTARGET402),                          !SETUP FOR D =0 TEST
                    LOAD-ERROR(TEST500C),                           !ERROR DIRECTORY KEY
                    DCS-CTR(C5.),                                   !COMPARE AT TARGET
                    BUMP-VERIFY,                                    !COUNT
            NEXT,   J/EXPEC500C                                     !
    (6726)  DCS[1.00.1.0.0.1]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.011.110]

    6136:  !(FREE)
    EXPEC500C:
            P3,     CSPD[EXPEC]+EMIT,                               !EXPECTED COUNT =
                    EMIT/7645,                                      !  (7645) = 4005.
            NEXT,   J/COMP500C                                      !
    (6136)  DCS[0.00.0.0.0.0]  BM[0000..10.11..11.10..100..101...0.0.0..0..0...0.0000...1..0000.0...11.000...001.011.111]

    6137:  !(FREE)
    COMP500C:
            P0,     BUMP-VERIFY,                                    !COUNT
            P3-T,   D+ASPLO[OVERLAP]-MINUS-CSPB[EXPEC],             !COMPARE RECEIVED:EXPECTED
                    SAVE-D[C],                                      !
            NEXT,   J/GOBUT500C                                     !
    (6137)  DCS[0.00.0.0.0.1]  BM[1101..11.00..10.00..000..111...1.1.0..0..0...0.0000...0..0000.0...11.000...001.100.000]

    6140:  !(FREE)
    GOBUT500C:
            SETUP,  RETURN/TEST500D,                                !RETURN TO START OF NEXT SUBTEST
            NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
                    J/BUTD-IS-ZERO                                  !CHECK EQUALITY
    (6140)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]

    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
    !
    !*** TEST 500D ***
    !CHECK THAT ASSERTING "OVERLAP L" ALLOWED THE SAME NUMBER OF SP REWRITES
    !TO ASPLO (CHECKED ABOVE) AS TO BSPLO (CHECKED HERE)
    6746:
    TEST500D:
```

```
11137            P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=0 TEST
11138                    LOAD-ERROR(TEST500D),                   !ERROR DIRECTORY KEY
11139                    DCS-CTR(C4.),                           !COMPARE AT TARGET
11140            NEXT,   J/COMP500D                              !
     (6746)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.001]
11141
11142    6141:  !(FREE)
11143    COMP500D:
11144            P3-T,   D+ASPLO[OVERLAP]-MINUS-BSPLO[OVERLAP],  !COMPARE A-COUNT:B-COUNT
11145                    SAVE-D[C],                              !
11146            NEXT,   J/GOBUT500D                             !
     (6141)  DCS[0.00.0.0.0.0]  BM[1101..00.10..10.00..000..111...1.1.0..0..0...0.0000...0..0000.0...11.000...001.100.010]
11147
11148    6142:  !(FREE)
11149    GOBUT500D:
11150            P0,     BUMP-VERIFY,                            !COUNT
11151            SETUP,  RETURN/TEST500E,                        !RETURN TO START OF NEXT SUBTEST
11152            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11153                    J/BUTD-IS-ZERO                          !CHECK EQUALITY
     (6142)  DCS[0.00.0.0.0.1]  BM[0110..00.11..10.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
11154
11155
11156
11157
11158
11159    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
11160
11161    !*** TEST 500E ***
11162    !CHECK THAT "PREFETCH(0)H" WAS ONLY ASSERTED 357. TIMES/16384. DATA PATTERNS
11163    6736:
11164    TEST500E:
11165            P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=0 TEST
11166                    LOAD-ERROR(TEST500E),                   !ERROR DIRECTORY KEY
11167                    DCS-CTR(C5.),                           !COMPARE AT TARGET
11168            NEXT,   J/EXPEC500E                             !
     (6736)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.100.011]
11169
11170    6143:  !(FREE)
11171    EXPEC500E:
11172            P0,     BUMP-VERIFY,                            !
11173            P3,     CSPD[EXPEC]+EMIT,                       !EXPECTED COUNT=
11174                    EMIT/545,                               ! (545)=357.
11175            NEXT,   J/COMP500E                              !
     (6143)  DCS[0.00.0.0.0.1]  BM[0000..10.00..01.01..100..101...0.0.0..0..0...0.0000...1..0000.0...11.000...001.100.100]
11176
11177    6144:  !(FREE)
11178    COMP500E:
11179            P3-T,   D+ASPHI[PREFETCH]-MINUS-CSPB[EXPEC],    !COMPARE RECEIVED:EXPECTED
11180                    SAVE-D[C],                              !
11181            NEXT,   J/GOBUT500E                             !
     (6144)  DCS[0.00.0.0.0.0]  BM[1101..11.00..11.00..000..111...1.1.0..0..0...0.0000...0..0000.0...11.000...001.100.101]
11182
11183    6145:  !(FREE)
```

```
11184    GOBUT500E:
11185            SETUP,  RETURN/SCOPE500F,                       !RETURN TO SCOPE LOOP TEST WORD
11186            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11187                    J/BUTD-IS-ZERO                          !CHECK EQUALITY
     (6145)  DCS[0.00.0.0.0.0]  BM[0110..00.00..11.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.0011]
11188
11189
11190
11191    6146:  !(FREE)
11192    SCOPE500F:
11193            PO,     BUMP-VERIFY,                            !COUNT
11194                    BUSDIN←EMIT-[I],                        !RESET PROC UCON
11195                    EN-CLK-IR[15-00],                       !
11196            NEXT,   BUTD[SCOPE],                            !NO ERROR: "TEST503A" (+1. WORDS)
11197                    J/TEST503A                              !   ERROR: "SETFETCHB500" (-27.WORDS)
     (6146)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.111.1111]
11198
11199
11200
11201
11202
11203    !.PAGE=============================================================================================================
11204
11205
11206    .TOC   *   TEST503-510:  PROCESSOR UCON TESTS (FLAGS, FPS, PS, BUTM) & ASSOC LOGIC
11207
11208    !*************************************************************************************
11209    !*
11210    !*      TESTS:  503A - 510F                                 UWORDS: 214 + 245
11211    !*
11212    !*      FUNCTIONS:      TESTS 503A - 510F MANIPULATE THE VARIOUS PROCESSOR UCON
11213    !*                      FUNCTIONS (FLAGS, EXFLAGS, FPS, PS, CUA) AND RELATED "BUT"
11214    !*                      TESTS TO SEE THAT ALL ARE FUNCTIONAL.
11215    !*
11216    !*************************************************************************************
11217
11218
11219
11220
11221
11222
11223
11224    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11225
11226    !*** TEST 503 ***
11227
11228    !TESTS 503 A-I USE DATA PATTERNS OF:
11229    !       FLAG<8:4,2:0>H = "10101010", EXFLAG<2:1>H = "01",
11230    !       FPS<7:0>H = "1010 1010"
11231
11232    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11233
11234    !*** TEST 503A ***
```

```
11235     !LOAD FLAGS<8:4,2:0> WITH "10101010", EXFLAGS<2:1> WITH "01", FPS<7:4> WITH "1010",
11236     !FPS<3:0> WITH "1010", AND READ BACK THRU "FLAGS#FPS" PORT OF PROCESSOR MUX
11237     6677:
11238     TEST503A:
11239             P0,     LOAD-ENUA(LOADNZW5),                    !COMPARE 1/2 WAY THRU BM SUBR
11240                     LOAD-ERROR(TEST503A),                   !ERROR DIRECTORY KEY
11241                     DCS-CTR(C10.),                          !COMPARE IN ...
11242                     BUMP-VERIFY,                            !COUNT
11243             NEXT,   J/LOADFLAG503A                          !
     (6677)  DCS[1.00.1.0.0.1]  BM[0101..00.10..00.11..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.001.100]
11244
11245     6614:
11246     LOADFLAG503A:
11247             P2-U,   IR←EMIT,                                !(125122)=NOT-FLTPT-H INSTR (NOTE UCON/CSPADDR OVLP)
11248                                                             !ALSO NOTE IR=(NOT-PREFETCH), SO PREFETCH-SAVE WILL GET "0"
11249                                                             !AFTER SUBSEQUENT JAMUPP (IN LOADFPSCC ROUTINE EXIT)
11250             P3,     CSPD[05]←EMIT,                          !INITIAL VALUE:
11251                     EMIT/125122,                            !FLAG<8:4,2:0>="10101010", EXFLAG<2:1>="01"
11252             NEXT,   J/LOADFPS503A                           !"10101010 0101 0010"
     (6614)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.01..010..010...0.0.0..0..0...1.1010...1..0000.0...11.000...001.100.111]
11253
11254     6147:  !(FREE)
11255     LOADFPS503A:
11256             P0,     BUMP-VERIFY,                            !COUNT
11257             P3,     CSPD[06]←EMIT,                          !INITIAL VALUE IN FPS<7:4>:
11258                     EMIT/052655,                            !"01010101 1010 1101"
11259             NEXT,   J/EXPEC503A                             !
     (6147)  DCS[0.00.0.0.0.1]  BM[0101..10.01..01.10..101..101...0.0.0..0..0...0.1001...1..0000.0...11.000...001.101.000]
11260
11261     6150:  !(FREE)
11262     EXPEC503A:
11263             !*** NOTE:  FLAG<8>, UBREAK ENABLE, GETS SET HERE.  KEEP SR=(000000)  [SET IN TEST500] TO FLAG
11264             !       THAT ANY SPURIOUS UBREAKS ARE ILLEGAL (IE, CAUSING A JAMUPP SEQUENCE  ***
11265             P3,     CSPD[02]←EMIT,                          !EXPECTED VALUE LOADS FLAGS, FPS<7:0>
11266                     EMIT/125252,                            !OF "FLAGS#FPS" PORT
11267             NEXT,   J/MASK503A                              !"10101010 1010 1010"
     (6150)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..101..010...0.0.0..0..0...0.1101...1..0000.0...11.000...001.101.001]
11268
11269     6151:  !(FREE)
11270     MASK503A:
11271             P3,     CSPD[04]←EMIT,                          !MASK OUT (TO ZEROS)
11272                     EMIT/177777,                            !LOOK AT ALL THE BITS
11273             NEXT,   J/LOADFCC503A                           !
     (6151)  DCS[0.00.0.0.0.0]  BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.1011...1..0000.0...11.000...001.101.010]
11274
11275     6152:  !(FREE)
11276     LOADFCC503A:
11277             P3,     CSPD[15]←EMIT,                          !FPS<3:0> COME FROM CSP(15)<3:0>[MD]
11278                     EMIT/000012,                            !"1010"
11279             NEXT,   J/DOFCC503A                             !
     (6152)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..001..010...0.0.0..0..0...0.0010...1..0000.0...11.000...001.101.011]
11280
11281     6153:  !(FREE)
11282     DOFCC503A:
```

```
11283            P3,     CSPD[00]←EMIT,                          !CALL BM SUBR WHICH DOES THE LOAD
11284                    RETURN/TESTA503A,                       !RETURN INLINE
11285            NEXT,   CALL[LOADFPSCC]                         !
    (6153)  DCS[0.00.0.0.0.0]  BM[0110..10.11..10.01..100..111...0.0.0..0..0...0.1111...1..0000.0...11.100...010.110.100]
11286
11287    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11288
11289    !NOW CHECK ALL THE RITE BITS WERE SET BY READING THEM BACK
11290
11291    6714:
11292    TESTA503A:
11293            P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
11294                    LOAD-ERROR(TESTA503A),                  !ERROR DIRECTORY KEY
11295                    DCS-CTR(C14.),                          !COMPARE AT TARGET
11296            P3,     BUTA(CUA-TRACK),                        !RESET CUA TRACKING AFTER JAMUPP
11297            NEXT,   J/GOPUT503A                             !
    (6714)  DCS[1.00.1.0.0.0]  BM[0001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.001...001.101.100]
11298
11299    6154:  !(FREE)
11300    GOPUT503A:
11301            SETUP,  RETURN/GOBUT503A,                       !GO TO SUBR WHICH:
11302            NEXT,   CALL[FLAGFPSSEQLOD]                     !1) CSP(05) -> FLAGS, EXFLAGS
    (6154)  DCS[0.00.0.0.0.0]  BM[0110..00.00..11.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.111.011]
11303                                                           !2) CSP(06) -> FPS<7:4>
11304
11305    6155:  !(FREE)
11306    GOBUT503A:
11307            SETUP,  RETURN/TEST503B,                        !RETURN TO START OF NEXT SUBTEST
11308            NEXT,   CALL[FLAGFPSTOD]                        ! FLAGS#FPS.XOR.CSP(02) -> D, BUT(D=0)
    (6155)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.010]
11309
11310
11311
11312
11313    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11314
11315    !*** TEST 503B ***
11316    !DO THE "MULTIPLE BUT" ON "FLAG7-H" TO CHECK IT'S CLEAR
11317    6630:
11318    TEST503B:
11319            P0,     LOAD-ENUA(ZTARGET406),                  !BIT<00> CLEAR
11320                    LOAD-ERROR(TEST503B),                   !ERROR DIRECTORY KEY
11321                    DCS-CTR(C4.),                           !COMPARE AT TARGET
11322            NEXT,   J/GOBUT503B                             !
    (6630)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.110]
11323
11324    6156:  !(FREE)
11325    GOBUT503B:
11326            SETUP,  RETURN/TEST503C,                        !RETURN TO START OF NEXT SUBTEST
11327            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11328                    J/BUTMFLAG7                             !FLAG 7-H IN BIT<00>
```

```
      (6156)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.101]
11329
11330
11331
11332
11333    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
11334
11335    !*** TEST 503C ***
11336    !DO THE "BUT" ON "FLTPT-PROC-H"="FLAGS-H*EXFLAG1-L" TO CHECK IT'S CLEAR
11337    6632:
11338    TEST503C:
11339            PO,     LOAD-ENUA(ZTARGET402),                  !BIT<00> CLEAR
11340                    LOAD-ERROR(TEST503C),                   !ERROR DIRECTORY KEY
11341                    DCS-CTR(C3.),                           !COMPARE AT TARGET
11342                    BUMP-VERIFY,                            !COUNT
11343            NEXT,   J/GOBUT503C                             !
      (6632)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.101.111]
11344
11345    6157:  !(FREE)
11346    GOBUT503C:
11347            SETUP,  RETURN/TEST503DA,                       !RETURN TO START OF NEXT SUBTEST
11348            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11349                    J/BUTFPPROC                             !FLAGS-H*EXFLAG1-L IN BIT<00>
      (6157)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.100]
11350
11351
11352
11353
11354    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
11355
11356    !*** TEST 503DA ***
11357    !DO THE "MULTIPLE BUT" ON "FLTPT" TO CHECK IT'S CLEAR, IR=(125122), NOT-FLTPT-H INSTR
11358    6601:
11359    TEST503DA:
11360            PO,     LOAD-ENUA(ZTARGET406),                  !BIT<00> CLEAR
11361                    LOAD-ERROR(TEST503DA),                  !ERROR DIRECTORY KEY
11362                    DCS-CTR(C4.),                           !COMPARE AT TARGET
11363            NEXT,   J/GOBUT503DA                            !
      (6601)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.000]
11364
11365    6160:  !(FREE)
11366    GOBUT503DA:
11367            SETUP,  RETURN/TEST503D,                        !RETURN TO START OF NEXT SUBTEST
11368            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11369                    J/BUTMFLTPTS                            !FLTPT-H IN BIT<00>
      (6160)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.001]
11370
11371
11372
11373
11374    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
```

```
11375
11376     !*** TEST 503D ***
11377     !DO AN INSTR-1 FLOATING POINT DECODE, TO CHECK THAT FLAG<4:5> -> BIT<1:0>
11378     6670:
11379     TEST503D:
11380             PO,     LOAD-ENUA(ZTARGET476),                  !INSTR-1 FLTPT, BIT<1:0>="10"
11381                     LOAD-ERROR(TEST503D),                   !ERROR DIRECTORY KEY
11382                     DCS-CTR(C4.),                           !COMPARE AT TARGET
11383             NEXT,   J/LOADIR503D
     (6670)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..111..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.001]
11384
11385     6161:  !(FREE)
11386     LOADIR503D:
11387             PO,     BUMP-VERIFY,                            !COUNT
11388             P2-U,   IR+EMIT,                                !IR <- FLTPT INSTR
11389                     EMIT/175252,                            !
11390             NEXT,   J/GOBUT503D                             !
     (6161)  DCS[0.00.0.0.0.1]  BM[1111..00.10..10.10..101..010...0.0.0..0..0...1.1010...0..0000.0...11.000...001.110.010]
11391
11392     6162:  !(FREE)
11393     GOBUT503D:
11394             SETUP,  RETURN/TEST503E,                        !RETURN TO START OF NEXT SUBTEST
11395             NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11396                     J/BUTINSTR1                             !FULL WIDTH
     (6162)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
11397
11398
11399
11400
11401     !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11402
11403     !*** TEST 503E ***
11404     !READ EXFLAGS<2:1> = "01" IN CUA-PORT<2:1>,
11405     !ALSO "PREFETCH-SAVE-H" = "0"  FROM PREVIOUS SETUP
11406     6700:
11407     TEST503E:
11408             PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=0 TEST
11409                     LOAD-ERROR(TEST503E),                   !ERROR DIRECTORY KEY
11410                     DCS-CTR(C10.),                          !COMPARE AT TARGET
11411             NEXT,   J/EXPEC503E                             !
     (6700)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.011]
11412
11413     6163:  !(FREE)
11414     EXPEC503E:
11415             PO,     BUMP-VERIFY,                            !COUNT
11416             P3,     CSPD[02]+EMIT,                          !CUA PORT READS AS:
11417                     EMIT/073732,                            !0#CUA<11:00>#EXFLAG<2:1>#PREFETCH
11418             NEXT,   J/GOPUT503E                             !
     (6163)  DCS[0.00.0.0.0.1]  BM[0111..10.01..11.11..011..010...0.0.0..0..0...0.1101...1..0000.0...11.000...001.110.100]
11419
11420     6164:  !(FREE)
11421     GOPUT503E:
11422             SETUP,  RETURN/TEST503F,                        !GO TO SUBR WHICH:
```

```
11423           NEXT,   CALL[CUATOD]                                    !PUTS CUA#EXFLAGS.XOR.CSP(02) -> D, BUT(D=ZERO)
     (6164)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.111]
11424
11425
11426
11427
11428    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11429
11430    !*** TEST 503F ***
11431    !DO THE "MULTIPLE BUT" ON EXFLAG<2> TO CHECK IT'S CLEAR
11432    6710:
11433    TEST503F:
11434           PO,     LOAD-ENUA(ZTARGET406),                           !BIT<00> CLEAR
11435                   LOAD-ERROR(TEST503F),                            !ERROR DIRECTORY KEY
11436                   DCS-CTR(C4.),                                    !COMPARE AT TARGET
11437           NEXT,   J/GOBUT503F                                      !
     (6710)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.101]
11438
11439    6165:  !(FREE)
11440    GOBUT503F:
11441           SETUP,  RETURN/TEST503G,                                 !RETURN TO START OF NEXT SUBTEST
11442           NEXT,   GOTO-PAGE(7),                                    !BUT TABLE
11443                   J/BUTMEXFLAG2                                    !EXFLAG<2>H IN BIT<00>
     (6165)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.011]
11444
11445
11446
11447
11448    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11449
11450    !*** TEST 503G ***
11451    !DO THE "MULTIPLE BUT" ON EXFLAG<1> TO CHECK IT'S SET
11452    6720:
11453    TEST503G:
11454           PO,     LOAD-ENUA(ZTARGET407),                           !BIT<00> SET
11455                   LOAD-ERROR(TEST503G),                            !ERROR DIRECTORY KEY
11456                   DCS-CTR(C4.),                                    !COMPARE AT TARGET
11457                   BUMP-VERIFY,                                     !COUNT
11458           NEXT,   J/GOBUT503G                                      !
     (6720)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.110]
11459
11460    6166:  !(FREE)
11461    GOBUT503G:
11462           SETUP,  RETURN/TEST503H,                                 !RETURN TO START OF NEXT SUBTEST
11463           NEXT,   GOTO-PAGE(7),                                    !BUT TABLE
11464                   J/BUTMEXFLAG1                                    !EXFLAG<1>H IN BIT<00>
     (6166)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.111]
11465
11466
11467
11468
```

```
11469    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11470
11471    !*** TEST 503H ***
11472    !CHECK FPS<5> SET, VIA BUTR
11473    6732:
11474    TEST503H:
11475            PO,     LOAD-ENUA(ZTARGET407),                  !BIT<00> SET
11476                    LOAD-ERROR(TEST503H),                   !ERROR DIRECTORY KEY
11477                    DCS-CTR(C3.),                           !COMPARE AT TARGET
11478                    BUMP-VERIFY,                            !COUNT
11479            NEXT,   J/GOBUT503H                             !
     (6732)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.110.111]
11480
11481    6167:  !(FREE)
11482    GOBUT503H:
11483            SETUP,  RETURN/TEST503I,                        !RETURN TO START OF NEXT SUBTEST
11484            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11485                    J/BUTFPS05                              !FPS <05> IN BIT<00>
     (6167)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.010]
11486
11487
11488
11489
11490    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11491
11492    !*** TEST 503I ***
11493    !CHECK FLTPT-FD-H = F(FPS<7:6>,FLAG<5,2,1,EX1>) IS CLEAR
11494    6742:
11495    TEST503I:
11496            PO,     LOAD-ENUA(ZTARGET402),                  !BIT<00> CLEAR
11497                    LOAD-ERROR(TEST503I),                   !ERROR DIRECTORY KEY
11498                    DCS-CTR(C3.),                           !COMPARE AT TARGET
11499            NEXT,   J/GOBUT503I                             !
     (6742)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.000]
11500
11501    6170:  !(FREE)
11502    GOBUT503I:
11503            PO,     BUMP-VERIFY,                            !COUNT
11504            SETUP,  RETURN/TEST503J,                        !RETURN TO START OF NEXT SUBTEST
11505            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11506                    J/BUTFPFD                               !FLTPT-FD-H IN BIT<00>
     (6170)  DCS[0.00.0.0.0.1]  BM[0110..00.11..11.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.111.001]
11507
11508    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11509
11510    !*** TEST 503J ***
11511    !DO THE "MULTIPLE BUT" ON "D<00>" TO CHECK IT'S CLEAR  (D WAS ZEROED IN TEST503E, ABOVE)
11512    6756:
11513    TEST503J:
11514            PO,     LOAD-ENUA(ZTARGET406),                  !BIT<00> CLEAR
11515                    LOAD-ERROR(TEST503J),                   !ERROR DIRECTORY KEY
11516                    DCS-CTR(C4.),                           !COMPARE AT TARGET
```

```
11517            NEXT,   J/GOBUT503J                                    !
     (6756)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.001]
11518
11519     6171:  !(FREE)
11520     GOBUT503I:
11521            SETUP,  RETURN/TEST503K,                               !RETURN TO START OF NEXT SUBTEST
11522            NEXT,   GOTO-PAGE(7),                                  !BUT TABLE
11523                    J/BUTMD00                                      !D<00>-H IN BIT<00>
     (6171)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.001]
11524
11525
11526     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11527
11528     !*** TEST 503K ***
11529     !DO THE "MULTIPLE BUT" ON "FLTPT" TO CHECK IT'S SET, IR=(175252), FLTPT-H INSTR
11530     6646:
11531     TEST503K:
11532            PO,     LOAD-EMUA(ZTARGET407),                         !BIT<00> SET
11533                    LOAD-ERROR(TEST503K),                          !ERROR DIRECTORY KEY
11534                    DCS-CTR(C4.),                                  !COMPARE AT TARGET
11535                    BUMP-VERIFY,                                   !COUNT
11536            NEXT,   J/GOBUT503K                                    !
     (6646)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...001.111.010]
11537
11538     6172:  !(FREE)
11539     GOBUT503K:
11540            SETUP,  RETURN/SCOPE503,                               !RETURN TO SCOPE LOOP TEST WORD
11541            NEXT,   GOTO-PAGE(7),                                  !BUT TABLE
11542                    J/BUTMFLTPTS                                   !FLTPT-H IN BIT<00>
     (6172)  DCS[0.00.0.0.0.0]  BM[0110..00.00..11.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.001]
11543
11544
11545
11546
11547
11548
11549     6173:  !(FREE)
11550     SCOPE503:
11551            PO,     BUSDIN+EMIT-[I],                               !RESET PROC UCONS
11552                    EN-CLK-IR[15-00],                              !
11553            NEXT,   BUTD[SCOPE],                                   !NO ERROR: "TEST504A" (+1. WORDS)
11554                    J/TEST504A                                     !   ERROR: "LOADFLAG503A" (-34. WORDS)
     (6173)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.001.101]
11555
11556
11557
11558
11559
11560
11561
11562
11563
```

```
11564     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11565
11566     !*** TEST 504 ***
11567
11568     !TESTS 504 A-I USE DATA PATTERNS OF:
11569     !       FLAG<8:4,2:0>H = "01010101", EXFLAG<2:1>H = "10",
11570     !       FPS<7:0>H = "0101 0101"
11571
11572     !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11573
11574     !*** TEST 504A ***
11575     !LOAD FLAGS<8:4,,2:0> WITH "01010101", EXFLAGS<2:1> WITH "10", FPS<7:4> WITH "0101",
11576     !FPS<3:0> WITH "0101", AND READ BACK THRU "FLAGS#FPS" PORT OF PROCESSOR MUX
11577     6615:
11578     TEST504A:
11579             PC,     LOAD-ENUA(4777),                        !SETUP FOR COMPARE 1/2 WAY + 1 THRU BM SUBR
11580                     LOAD-ERROR(TEST504A),                   !ERROR DIRECTORY KEY
11581                     DCS-CTR(C11.),                          !COMPARE AT ...
11582             NEXT,   J/LOADFLAG504A                          !
      (6615)  DCS[1.00.1.0.0.0]  BM[0100..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.010]
11583
11584     6622:
11585     LOADFLAG504A:
11586             P2-U,   IR←EMIT,                                !ALSO NOTE IR=(NOT-PREFETCH), SO PREFETCH-SAVE WILL GET "0"
11587                                                             !AFTER SUBSEQUENT JAMUPP (IN LOADFPSCC ROUTINE EXIT)
11588             P3,     CSPD[05]←EMIT,                          !INITIAL VALUE:
11589                     EMIT/052644,                            !FLAG<8:4,2:0>="01010101", EXFLAG<2:1>="10"
11590             NEXT,   J/LOADFPS504A                           !"01010101 1010 0100"
      (6622)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.10..100..100...0.0.0..0..0...1.1010...1..0000.0...11.000...001.111.100]
11591
11592     6174:  !(FREE)
11593     LOADFPS504A:
11594             P3,     CSPD[06]←EMIT,                          !INITIAL VALUE IN FPS<7:4>:
11595                     EMIT/125133,                            !"10101010 0101 1011"
11596             NEXT,   J/EXPEC504A                             !
      (6174)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.01..011..011...0.0.0..0..0...0.1001...1..0000.0...11.000...001.111.101]
11597
11598     6175:  !(FREE)
11599     EXPEC504A:
11600             P3,     CSPD[02]←EMIT,                          !EXPECTED VALUE LOADS FLAGS, FPS<7:0>
11601                     EMIT/052525,                            !OF "FLAGS#FPS" PORT
11602             NEXT,   J/LOADFCC504A                           !"01010101 0101 0101"
      (6175)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.1101...1..0000.0...11.000...001.111.110]
11603
11604     6176:  !(FREE)
11605     LOADFCC504A:
11606             P3,     CSPD[15]←EMIT,                          !FPS<3:0> COME FROM CSP(15)<3:0>[MD]
11607                     EMIT/000005,                            !"0101"
11608             NEXT,   J/DOFCC504A                             !
      (6176)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..101...0.0.0..0..0...0.0010...1..0000.0...11.000...001.111.111]
11609
11610     6177:  !(FREE)
11611     DOFCC504A:
11612             P3,     CSPD[00]←EMIT,                          !CALL BM SUBR WHICH DOES THE LOAD
```

```
11613                   RETURN/TESTA504A,                       !RETURN INLINE
11614           NEXT,   CALL[LOADFPSCC]                         !
     (6177)  DCS[0.00.0.0.0.0]  BM[0110..10.11..11.10..110..111...0.0.0..0..0...0.1111...1..0000.0...11.100...010.110.100]
11615
11616   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11617
11618   !NOW CHECK ALL THE RITE BITS WERE SET BY READING THEM BACK
11619
11620   6766:
11621   TESTA504A:
11622           PD,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
11623                   LOAD-ERROR(TESTA504A),                  !ERROR DIRECTORY KEY
11624                   DCS-CTR(C14.),                          !COMPARE AT TARGET
11625                   BUMP-VERIFY,                            !COUNT
11626           P3,     BUTA(CUA-TRACK),                        !RESET CUA TRACKING AFTER JAMUPP
11627           NEXT,   J/GOPUT504A                             !
     (6766)  DCS[1.00.1.0.0.1]  BM[0001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.001...010.000.000]
11628
11629   6200:  !(FREE)
11630   GOPUT504A:
11631           SETUP,  RETURN/GOBUT504A,                       !GO TO SUBR WHICH:
11632           NEXT,   CALL[FLAGFPSSEQL00]                     !1) CSP(05) -> FLAGS, EXFLAGS
     (6200)  DCS[0.00.0.0.0.0]  BM[0110..00.01..00.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.111.011]
11633                                                           !2) CSP(06) -> FPS<7:4>
11634
11635   6201:  !(FREE)
11636   GOBUT504A:
11637           SETUP,  RETURN/TEST504B,                        !RETURN TO START OF NEXT SUBTEST
11638           NEXT,   CALL[FLAGFPST00]                        ! FLAGS#FPS.XOR.CSP(02) -> D, BUT(D=0)
     (6201)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.010]
11639
11640
11641
11642   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11643
11644   !*** TEST 5048 ***
11645   !DO THE "MULTIPLE BUT" ON "FLAG7-H" TO CHECK IT'S SET
11646   6730:
11647   TEST5048:
11648           PD,     LOAD-EMUA(ZTARGET407),                  !BIT<00> SET
11649                   LOAD-ERROR(TEST5048),                   !ERROR DIRECTORY KEY
11650                   DCS-CTR(C4.),                           !COMPARE AT TARGET
11651           NEXT,   J/GOBUT5048                             !
     (6730)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.010]
11652
11653   6202:  !(FREE)
11654   GOBUT5048:
11655           SETUP,  RETURN/TEST504C,                        !RETURN TO START OF NEXT SUBTEST
11656           NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11657                   J/BUTMFLAG7                             !FLAG7-H IN BIT<00>
```

```
      (6202)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.101]
11658
11659
11660
11661
11662    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11663
11664    !*** TEST 504C ***
11665    !DO THE "BUT" ON "FLTPT-PROC-H"="FLAG<5>-H*EXFLAG<1>-L" TO CHECK IT'S SET
11666    6740:
11667    TEST504C:
11668          PO,     LOAD-ENUA(ZTARGET403),                    !BIT<00> SET
11669                  LOAD-ERROR(TEST504C),                     !ERROR DIRECTORY KEY
11670                  DCS-CTR(C3.),                             !COMPARE AT TARGET
11671                  BUMP-VERIFY,                              !COUNT
11672          NEXT,   J/GOBUT504C                               !
      (6740)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.011]
11673
11674    6203:  !(FREE)
11675    GOBUT504C:
11676          SETUP,  RETURN/TEST504D,                          !RETURN TO START OF NEXT SUBTEST
11677          NEXT,   GOTO-PAGE(7),                             !BUT TABLE
11678                  J/BUTFPPROC                               !FLAG5-H*EXFLAG1-L IN BIT<00>
      (6203)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.100]
11679
11680
11681
11682
11683    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11684
11685    !*** TEST 504D ***
11686    !DO AN INSTR-1 FLOATING POINT DECODE, TO CHECK THAT FLAG<4:5> -> BIT<1:0>
11687    6750:
11688    TEST504D:
11689          PO,     LOAD-ENUA(ZTARGET475),                    !INSTR-1 FLTPT, BIT<1:0>="01"
11690                  LOAD-ERROR(TEST504D),                     !ERROR DIRECTORY KEY
11691                  DCS-CTR(C4.),                             !COMPARE AT TARGET
11692          NEXT,   J/LOADIR504D                              !
      (6750)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..111..101...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.100]
11693
11694    6204:  !(FREE)
11695    LOADIR504D:
11696          PO,     BUMP-VERIFY,                              !COUNT
11697          P2-U,   IR<-EMIT,                                 !IR <- FLTPT INSTR
11698                  EMIT/172525,                              !
11699          NEXT,   J/GOBUT504D                               !
      (6204)  DCS[0.00.0.0.0.1]  BM[1111..00.01..01.01..010..101...0.0.0..0..0...1.1010...0..0000.0...11.000...010.000.101]
11700
11701    6205:  !(FREE)
11702    GOBUT504D:
11703          SETUP,  RETURN/TEST504E,                          !RETURN TO START OF NEXT SUBTEST
11704          NEXT,   GOTO-PAGE(7),                             !BUT TABLE
11705                  J/BUTINSTR1                               !FULL WIDTH
```

```
      (6205)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.110]
11706
11707
11708
11709
11710    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11711
11712    !*** TEST 504E ***
11713    !READ EXFLAGS<2:1>="10" IN CUA-PORT<2:1>
11714    !ALSO "PREFETCH-SAVE-H"="0" FROM PREVIOUS SETUP
11715    6760:
11716    TEST504E:
11717            P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=0 TEST
11718                    LOAD-ERROR(TEST504E),                   !ERROR DIRECTORY KEY
11719                    DCS-CTR(C10.),                          !COMPARE AT TARGET
11720            NEXT,   J/EXPEC504E                             !
      (6760)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.000.110]
11721
11722    6206:  !(FREE)
11723    EXPEC504E:
11724            P0,     BUMP-VERIFY,                            !COUNT
11725            P3,     CSP0[02]+EMIT,                          !CUA PORT READS AS:
11726                    EMIT/073734,                            !0#CUA<11:00>#EXFLAG<2:1>#PREFETCH
11727            NEXT,   J/GOPUT504E                             !
      (6206)  DCS[0.00.0.0.0.1]  BM[0111..10.01..11.11..011..100...0.0.0..0..0...0.1101...1..0000.0...11.000...010.000.111]
11728
11729    6207:  !(FREE)
11730    GOPUT504E:
11731            SETUP,  RETURN/TEST504F,                        !GO TO SUBR WHICH:
11732            NEXT,   CALL[CUATOD]                            !PUTS CUA#EXFLAGS.XOR.CSP(02) -> D, BUT(D=ZERO)
      (6207)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.111]
11733
11734
11735
11736
11737    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11738
11739    !*** TEST 504F ***
11740    !DO THE "MULTIPLE BUT" ON EXFLAG<2> TO CHECK IT'S SET
11741    6672:
11742    TEST504F:
11743            P0,     LOAD-EMUA(ZTARGET407),                  !BIT<00> SET
11744                    LOAD-ERROR(TEST504F),                   !ERROR DIRECTORY KEY
11745                    DCS-CTR(C4.),                           !COMPARE AT TARGET
11746            NEXT,   J/GOBUT504F                             !
      (6672)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.000]
11747
11748    6210:  !(FREE)
11749    GOBUT504F:
11750            SETUP,  RETURN/TEST504G,                        !RETURN TO START OF NEXT SUBTEST
11751            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11752                    J/BUTMEXFLAG2                           !EXFLAG<2>H IN BIT 0
```

```
      (6210)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.011]
11753
11754
11755
11756
11757    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11758
11759    !*** TEST 504G ***
11760    !DO THE "MULTIPLE BUT" ON EXFLAG<1> TO CHECK IT'S CLEAR
11761    6702:
11762    TEST504G:
11763            PO,     LOAD-EMUA(ZTARGET406),                  !BIT<00> CLEAR
11764                    LOAD-ERROR(TEST504G),                   !ERROR DIRECTORY KEY
11765                    DCS-CTR(C4.),                           !COMPARE AT TARGET
11766                    BUMP-VERIFY,                            !COUNT
11767            NEXT,   J/GOBUT504G                             !
      (6702)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.001]
11768
11769    6211:  !(FREE)
11770    GOBUT504G:
11771            SETUP,  RETURN/TEST504H,                        !RETURN TO START OF NEXT SUBTEST
11772            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11773                    J/BUTMEXFLAG                            !EXFLAG<1>H IN BIT 0
      (6211)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.111]
11774
11775
11776
11777
11778    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11779
11780    !*** TEST 504H ***
11781    !CHECK FPS<5> CLEAR, VIA BUTR
11782    6706:
11783    TEST504H:
11784            PO,     LOAD-EMUA(ZTARGET406),                  !BIT<00> CLEAR
11785                    LOAD-ERROR(TEST504H),                   !ERROR DIRECTORY KEY
11786                    DCS-CTR(C3.),                           !COMPARE AT TARGET
11787                    BUMP-VERIFY,                            !COUNT
11788            NEXT,   J/GOBUT504H                             !
      (6706)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.001.010]
11789
11790    6212:  !(FREE)
11791    GOBUT504H:
11792            SETUP,  RETURN/TEST504I,                        !RETURN TO START OF NEXT SUBTEST
11793            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
11794                    J/BUTFPS05                              !FPS<05> IN BIT<00>
      (6212)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.010]
11795
11796
11797
11798
```

```
11799    ! - - -
```

```
11849                   LOAD-ERROR(TEST505A),                   !ERROR DIRECTORY KEY
11850                   DCS-CTR(C15.),                          !COMPARE AT TARGET
11851             NEXT, J/LOAD505A                              !
     (6623)  DCS[1.00.1.0.0.0]  BM[0000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.000]
11852
11853     6620:
11854     LOAD505A:
11855             P3,   CSPD[05]←EMIT,                          !LOAD FLAGS<8:4,2:0>,
11856                   EMIT/177406,                            !EXFLAG<2:1> WITH ALL 1-S
11857             NEXT, J/EXPEC505A                             !
     (6620)  DCS[0.00.0.0.0.0]  BM[1111..10.11..11.00..000..110...0.0.0..0..0...0.1010...1..0000.0...11.000...010.001.101]
11858
11859     6215:  !(FREE)
11860     EXPEC505A:
11861             P0,   BUMP-VERIFY,                            !COUNT
11862             P3,   CSPD[02]←EMIT,                          !AFTER BUTA(CLR-FLAG-...), EXPECT THIS IN FLAGS#FPS PORT:
11863                   EMIT/174125,                            !"11111000 0101 0101"
11864             NEXT, J/SETFLAG505A                           !
     (6215)  DCS[0.00.0.0.0.1]  BM[1111..10.10..00.01..010..101...0.0.0..0..0...0.1101...1..0000.0...11.000...010.001.110]
11865
11866     6216:  !(FREE)
11867     SETFLAG505A:
11868             P0,   BUMP-VERIFY,                            !COUNT
11869             SETUP, RETURN/BUTCLR505A,                     !GO TO SUBR WHICH:
11870             NEXT, CALL[FLAGLOD]                           !PUTS CSP(05) INTO THE FLAGS
     (6216)  DCS[0.00.0.0.0.1]  BM[0110..00.01..00.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...000.111.110]
11871
11872     6217:  !(FREE)
11873     BUTCLR505A:
11874             P0,   DCS-CTR(C9.),                           !POINT COUNTER AT TARGET
11875             P3,   BUTA(CLR-FLAG-RES-UCON),                !CLEAR SHORT-TERM FLAGS
11876             NEXT, J/GOPUT505A                             !
     (6217)  DCS[0.00.1.0.0.0]  BM[0110..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.010...010.010.000]
11877
11878     6220:  !(FREE)
11879     GOPUT505A:
11880             SETUP, RETURN/TEST505B,                       !GO TO SUBR WHICH:
11881             NEXT,  CALL[FLAGFPSTOD]                       !FLAGS#FPS.XOR.CSP(2) -> D, BUT(D=ZERO)
     (6220)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.010]
11882
11883
11884
11885
11886     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11887
11888     !*** TEST 505B ***
11889     !CHECK EXFLAG<2> NOT CLEARED, VIA BUTM
11890     6712:
11891     TEST505B:
11892             P0,   LOAD-ENUA(ZTARGET407),                  !BIT<00> SET
11893                   LOAD-ERROR(TEST505B),                   !ERROR DIRECTORY KEY
11894                   DCS-CTR(C4.),                           !COMPARE AT TARGET
```

```
11895                   BUMP-VERIFY,                                    !COUNT
11896           NEXT,   J/GOBUT505B                                     !
     (6712)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.010.001]
11897
11898     6221:  !(FREE)
11899     GOBUT505B:
11900           SETUP,  RETURN/TEST505C,                                !RETURN TO START OF NEXT SUBTEST
11901           NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
11902                   J/BUTMEXFLAG2                                   !EXFLAG<2> IN BIT<00>
     (6221)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.011]
11903
11904
11905
11906
11907     !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11908
11909     !*** TEST 505C ***
11910     !CHECK EXFLAG<1> WAS CLEARED, VIA BUTM
11911     6722:
11912     TEST505C:
11913           PO,     LOAD-ENUA(ZTARGET406),                          !BIT<00> CLEAR
11914                   LOAD-ERROR(TEST505C),                           !ERROR DIRECTORY KEY
11915                   DCS-CTR(C4.),                                   !COMPARE AT TARGET
11916           NEXT,   J/GOBUT505C                                     !
     (6722)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.010.011]
11917
11918     6223:  !(FREE)
11919     GOBUT505C:
11920           SETUP,  RETURN/SCOPE505,                                !RETURN TO SCOPE LOOP TEST WORD
11921           NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
11922                   J/BUTMEXFLAG1                                   !EXFLAG<1> IN BIT<00>
     (6223)  DCS[0.00.0.0.0.0]  BM[0110..00.01..00.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.111]
11923
11924     6224:  !(FREE)
11925     SCOPE505:
11926           PO,     BUMP-VERIFY,                                    !COUNT
11927                   BUSDIN←EMIT-[I],                                !EMIT FOR CONSTANTS
11928           P3,     FLAG[8-0]←D[15-8]-[I],                          !ZERO ALL FLAGS. D WAS LEFT
11929                   FPS[7-4]←D[7-4]-[I],                            !  ZERO FROM TEST505A, IF ALL OK.
11930           NEXT,   BUTD[SCOPE],                                    !NO ERROR: "TEST506A" (+1. WORDS)
11931                   J/TEST506A                                      !   ERROR: "LOAD505A" (-9. WORDS)
     (6224)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.01..100..001...0.0.0..0..0...1.1011...0..0000.0...11.000...110.010.001]
11932
11933
11934
11935
11936
11937
11938     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
11939
11940     !*** TEST 506 ***
11941
```

```
11942    !TESTS 506 A-E USE A "0-1-1010-1010" PATTERN IN PS<15,13,7:4,3:0>
11943
11944    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
11945
11946    !* TEST 506A *
11947    !LOAD UP PS<HI,MID,LO> IN ORDER, READ BACK THRU PS PORT OF PROC MUX
11948    !  ALSO CHECK THAT BUTA(CLR-FLAG-RES-UCON) CLEARS UCON REGISTER, SO THAT:
11949    !    (1) BUSDIN←EMIT IS SELECTED, VIA UCON-SELECT(1)H=LOW, AND
11950    !    (2) MAKE SURE THAT THE OTHER UCON BIT LATCHES ARE ALSO CLEARED
11951    6621:
11952    TEST506A:
11953            PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
11954                    LOAD-ERROR(TEST506A),                   !ERROR DIRECTORY KEY
11955                    DCS-CTR(C15.),                          !STALL FOR NOW
11956            NEXT,   J/EXPEC506A                             !
     (6621)  DCS[1.00.1.0.0.0]  BM[0000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.001.010]
11957
11958    6612:
11959    EXPEC506A:
11960            P3,     CSPD[02]←EMIT,                          !EXPECTED VALUE TO BE READ OUT OF
11961                    EMIT/030252,                            !PS AFTER LOADING:
11962            NEXT,   J/SETUCON506A                           !"0011 0000 1010 1010"
     (6612)  DCS[0.00.0.0.0.0]  BM[0011..10.00..00.10..101..010...0.0.0..0..0...0.1101...1..0000.0...11.000...010.010.101]
11963
11964    6225:  !(FREE)
11965    SETUCON506A:
11966            PO,     BUSDIN←FLAGS#FPS-[I],                   !TAKE EMIT OFF BUSDIN, FLAG#FPS=(000005)
11967            P3,     BUTA(CLR-FLAG-RES-UCON),                !THIS SHOULD NOW CLEAR THE UCON REGISTER,
11968                                                            !  SETTING UCON-SELECT(1)H=L; FORCING BUSDIN←EMIT
11969            NEXT,   J/PSHI506A                              !
     (6225)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.010...010.010.110]
11970
11971    6226:  !(FREE)
11972    PSHI506A:
11973            PO,     BUMP-VERIFY,                            !COUNT
11974            P3,     CSPD[05]←EMIT,                          !VALUE IN D WHEN LOAD PS<15,13>:
11975                    EMIT/063125,                            !"0110 0110 0101 0101"
11976            NEXT,   J/PSMID506A                             !
     (6226)  DCS[0.00.0.0.0.1]  BM[0110..10.01..10.01..010..101...0.0.0..0..0...0.1010...1..0000.0...11.000...010.010.111]
11977
11978    6227:  !(FREE)
11979    PSMID506A:
11980            P3,     CSPD[06]←EMIT,                          !VALUE IN D WHEN LOAD PS<7:4>:
11981                    EMIT/143245,                            !"1100 0110 1010 0101"
11982            NEXT,   J/PSLO506A                              !
     (6227)  DCS[0.00.0.0.0.0]  BM[1100..10.01..10.10..100..101...0.0.0..0..0...0.1001...1..0000.0...11.000...010.011.000]
11983
11984    6230:  !(FREE)
11985    PSLO506A:
11986            PO,     BUMP-VERIFY,                            !COUNT
11987            P3,     CSPD[07]←EMIT,                          !VALUE IN D WHEN LOAD PS<3:0>:
11988                    EMIT/143132,                            !"1100 0110 0101 1010"
11989            NEXT,   J/FUDGEPS506A                           !
     (6230)  DCS[0.00.0.0.0.1]  BM[1100..10.01..10.01..011..010...0.0.0..0..0...0.1000...1..0000.0...11.000...010.011.001]
```

```
11990
11991    6231:  !(FREE)
11992    FUDGEPS506A:
11993           SETUP,  RETURN/LOADUCON506A,                    !GO TO SUBR WHICH:
11994                                                           !1) CSP(05) -> PS<15,13>
11995                                                           !2) CSP(06) -> PS<7:4>
11996           NEXT,   CALL[PSSEQLOD]                          !3) CSP(07) -> PS<3:0>
     (6231)  DCS[0.00.0.0.0.0]  BM[0111..00.00..01.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.000.000]
11997
11998    7067:  !(FREE)
11999    LOADUCON506A:
12000           SETUP,  UCON-PROC,                              !SETUP FOR UCON-PROC:
12001           ENABLE, BUSDIN+FLAGS#FPS-[1],                   !FLAGS#FPS=(000005)
12002                   EN-CLK-PS[15-12], EN-CLK-PS[7-4],       !SETUP FOR CLOCKING PS BITS
12003                   EN-CLK-PS[3-0],                         !
12004           P0,     SET-UCON-CONTROL,                       !WRITE THE UCON REGISTER AT P0,
12005           P3,     BUTA(CLR-FLAG-RES-UCON),                !BUT AT P3, NOW CLEAR IT OUT
12006           NEXT,   J/DOIT506A                              !
     (7067)  DCS[0.00.0.0.0.0]  BM[1000..00.00..11.01..010..010...0.0.0..0..0...1.1001...0..0000.0...11.010...000.111.010]
12007
12008    7072:  !(FREE)
12009    DOIT506A:
12010           P2-T,   D+ZERO,                                 !SETUP D WITH A (000000)
12011           NEXT,   GOTO-PAGE(6),                           !XFER
12012                   J/LOADDCS506A                           !
     (7072)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..110...0.1.0..0..0...0.0000...0..0000.0...11.100...001.000.100]
12013
12014    6104:  !(FREE)
12015    LOADDCS506A:
12016           P0,     DCS-CTR(C9.),                           !COMPARE AT TARGET
12017           P2,     UCON-OPERATION,                         !IF THE UCON REGISTER WASN'T CLEARED, ABOVE,
12018           NEXT,   GOTO-PAGE(7),                           !  THE PS SHOULD BE OVER-WRITTEN WITH (000000),
12019                   J/GOBUT506A                             !    IN SOME COMBINATION OF PS<15:12,7:4,3:0>
     (6104)  DCS[0.00.1.0.0.0]  BM[0110..00.00..00.00..000..111...0.0.0..0..0...1.1010...0..0000.0...11.100...000.111.001]
12020
12021    7071:  !(FREE)
12022    GOBUT506A:
12023           SETUP,  RETURN/TEST5068,                        !RETURN TO START OF NEXT SUBTEST
12024           NEXT,   CALL[PSTOD]                             !  PS-XOR-CSP(02) -> D, BUT(D=ZERO)
     (7071)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.011]
12025
12026
12027
12028
12029    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12030
12031    !* TEST 5068 *
12032    !CHECK THAT BUTR(PS15) SHOWS PS<15>H CLEAR
12033    6754:
12034    TEST5068:
12035           P0,     LOAD-ENUA(ZTARGET402),                  !BIT<00> CLEAR
```

```
12036                   LOAD-ERROR(TEST506B),                   !ERROR DIRECTORY KEY
12037                   DCS-CTR(C3.),                           !COMPARE AT TARGET
12038             NEXT, J/GOBUT506B                             !
    (6754)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.011]
12039
12040     6233:  !(FREE)
12041     GOBUT506B:
12042           SETUP,  RETURN/TEST506C,                        !RETURN TO START OF NEXT SUBTEST
12043           NEXT,   GOTO-PAGE(7),                           !BUT TABLE HERE
12044                   J/BUTPS15                               !PS<15>H IN BIT<00>
    (6233)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.011]
12045
12046
12047
12048
12049     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
12050
12051     !* TEST 506C *
12052     !CHECK THAT BUTM(PS03) SHOWS PS<03>H SET
12053     6744:
12054     TEST506C:
12055           PO,     LOAD-ENUA(ZTARGET407),                  !BIT<00> SET
12056                   LOAD-ERROR(TEST506C),                   !ERROR DIRECTORY KEY
12057                   DCS-CTR(C4.),                           !COMPARE AT TARGET
12058                   BUMP-VERIFY,                            !COUNT
12059             NEXT, J/GO6UT506C                             !
    (6744)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.100]
12060
12061     6234:  !(FREE)
12062     GOBUT506C:
12063           SETUP,  RETURN/TEST506D,                        !RETURN TO START OF NEXT SUBTEST
12064           NEXT,   GOTO-PAGE(7),                           !BUT TABLE HERE
12065                   J/BUTMPS[N]                             !PS[N]=PS<03>H IN BIT<00>
    (6234)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.011]
12066
12067
12068
12069
12070     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
12071
12072     !* TEST 506D *
12073     !CHECK THAT WHEN FLAG<0>H=L AND PS<04>H=L,
12074     !  MASKED-PS[T]-H=FLAG<0>L*PS<04>H, IS LOW
12075     6734:
12076     TEST506D:
12077           PO,     LOAD-ENUA(ZTARGET406),                  !BIT<00> CLEAR
12078                   LOAD-ERROR(TEST506D),                   !ERROR DIRECTORY KEY
12079                   DCS-CTR(C4.),                           !COMPARE AT TARGET
12080             NEXT, J/GOBUT506D                             !
    (6734)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.101]
12081
12082     6235:  !(FREE)
```

```
12083    GOBUT506D:
12084            PO,     BUMP-VERIFY,                          !COUNT
12085            SETUP,  RETURN/TEST506E,                      !RETURN TO START OF NEXT SUBTEST
12086            NEXT,   GOTO-PAGE(7),                         !BUT TABLE HERE
12087                    J/BUTMMASKPS[T]                       !FLAG<0>L*PS<04>H IN BIT<00>
     (6235)  DCS[0.00.0.0.0.1]  BM[0110..00.11..00.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.111]
12088
12089
12090
12091
12092    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12093
12094    !* TEST 506E *
12095    !CHECK THAT INTR-HIGH-H=SERVICE(0)H*NOT(MASKED-PS[T]-H) IS HIGH,
12096    !  WHEN SERVICE(0)H=HIGH, MASKED-PS[T]-H=LOW
12097    !NOTE:  THE SUBR CALLED SHOULD SET SERVICE(0)H=HIGH (NEGATED) BY CLEARING OUT ALL ITS INPUT CONDITIONS
12098    6605:
12099    TEST506E:
12100            PO,     LOAD-ENUA(ZTARGET403),                !BIT<01> SET
12101                    LOAD-ERROR(TEST506E),                 !ERROR DIRECTORY KEY
12102                    DCS-CTR(C9.),                         !COMPARE AT TARGET
12103            NEXT,   J/CLEAR506E                           !
     (6605)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.011.110]
12104
12105    6236:  !(FREE)
12106    CLEAR506E:
12107            PO,     BUMP-VERIFY,                          !COUNT
12108            SETUP,  RETURN/GOBUT506E,                     !GO TO SUBR WHICH CLEARS OUT
12109            NEXT,   CALL[CLEAR-I-O-B]                     !  ALL THE UNIBUS/I-O/SERVICE LATCHES  (NO UNIBUS INIT)
     (6236)  DCS[0.00.0.0.0.1]  BM[0110..00.01..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.000]
12110
12111    6237:  !(FREE)
12112    GOBUT506E:
12113            SETUP,  RETURN/SCOPE506,                      !RETURN TO SCOPE LOOP TEST WORD
12114            NEXT,   GOTO-PAGE(7),                         !BUT TABLE HERE
12115                    J/BUTINTRHIGH                         !INTR HIGH H IN BIT<01>
     (6237)  DCS[0.00.0.0.0.0]  BM[0110..00.01..01.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.101]
12116
12117
12118
12119
12120    6240:  !(FREE)
12121    SCOPE506:
12122            PO,     BUSDIN←EMIT-[I],                      !KEEP EMIT FOR CONSTANTS
12123            P2,     PS←D-[I],                             !ZERO PS: D LEFT ZERO FROM
12124                                                          !PREVIOUS TESTS IF ALL OK
12125            NEXT,   BUTD[SCOPE],                          !NO ERROR: "TEST507A" (+1. WORDS)
12126                    J/TEST507A                            !   ERROR: "MASK506A" (-16. WORDS)
     (6240)  DCS[0.00.0.1.0.0]  BM[1000..00.00..00.01..010..010...0.0.0..0..0...1.1011...0..0000.0...11.000...110.001.011]
12127
12128
```

```
12129
12130
12131
12132
12133    ! - - -
```

```
12178           SETUP,  RETURN/LOADDCS507A,                     !GO TO SUBR WHICH:
12179           NEXT,   CALL[PSSEQLOD]                          !1) CSP(05) -> PS<15:13>
    (6244)  DCS[0.00.0.0.0.0]  BM[0110..00.01..01.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.000.000]
12180                                                           !2) CSP(06) -> PS<7:4>
12181                                                           !3) CSP(07) -> PS<3:0>
12182
12183   6245:  !(FREE)
12184   LOADDCS507A:
12185           PO,     DCS-CTR(C9.),                           !COMPARE AT TARGET
12186           NEXT,   J/GOBUT507A                             !
    (6245)  DCS[0.00.1.0.0.0]  BM[0110..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...010.100.110]
12187
12188   6246:  !(FREE)
12189   GOBUT507A:
12190           SETUP,  RETURN/TEST507B,                        !RETURN TO START OF NEXT SUBTEST
12191           NEXT,   CALL[PSTOD]                             !  CSP(02)-XOR-PS -> D, BUT(D=ZERO)
    (6246)  DCS[0.00.0.0.0.0]  BM[0110..00.11..10.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.011]
12192
12193
12194
12195
12196   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12197
12198   !* TEST 507B *
12199   !CHECK THAT BUTR(PS15) SHOWS PS<15>H SET
12200   6724:
12201   TEST507B:
12202           PO,     LOAD-ENUA(ZTARGET403),                  !BIT<00> SET
12203                   LOAD-ERROR(TEST507B),                   !ERROR DIRECTORY KEY
12204                   DCS-CTR(C3.),                           !COMPARE AT TARGET
12205           NEXT,   J/GOBUT507B                             !
    (6724)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.100.111]
12206
12207   6247:  !(FREE)
12208   GOBUT507B:
12209           SETUP,  RETURN/TEST507C,                        !RETURN TO START OF NEXT SUBTEST
12210           NEXT,   GOTO-PAGE(7),                           !BUT TABLE HERE
12211                   J/BUTPS15                               !PS<15>H IN BIT<00>
    (6247)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.011]
12212
12213
12214
12215
12216   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12217
12218   !* TEST 507C *
12219   !CHECK THAT BUTM(PS03) SHOWS PS<03>H CLEAR
12220   6611:
12221   TEST507C:
12222           PO,     LOAD-ENUA(ZTARGET406),                  !BIT<00> CLEAR
12223                   LOAD-ERROR(TEST507C),                   !ERROR DIRECTORY KEY
```

```
12224                   DCS-CTR(C4.),                                   !COMPARE AT TARGET
12225                   BUMP-VERIFY,                                    !COUNT
12226             NEXT, J/GOBUT507C                                     !
     (6611)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.000]
12227
12228     6250:  !(FREE)
12229     GOBUT507C:
12230             SETUP,  RETURN/TEST507D,                                !RETURN TO START OF NEXT SUBTEST
12231             NEXT,   GOTO-PAGE(7),                                   !BUT TABLE HERE
12232                     J/BUTMPS[N]                                     !PS[N]=PS<03>H IN BIT<00>
     (6250)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.011]
12233
12234
12235
12236
12237     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12238
12239     !* TEST 507D *
12240     !CHECK THAT WHEN FLAG<0>H=L AND PS<04>H=H,
12241     !  MASKED-PS[T]-H=FLAG<0>L*PS<04>H, IS HIGH
12242     6557:
12243     TEST507D:
12244             PO,     LOAD-ENUA(ZTARGET407),                          !BIT<00> SET
12245                     LOAD-ERROR(TEST507D),                           !ERROR DIRECTORY KEY
12246                     DCS-CTR(C4.),                                   !COMPARE AT TARGET
12247             NEXT,   J/GOBUT507D                                     !
     (6557)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.001]
12248
12249     6251:  !(FREE)
12250     GOBUT507D:
12251             PO,     BUMP-VERIFY,                                    !COUNT
12252             SETUP,  RETURN/TEST507E,                                !RETURN TO START OF NEXT SUBTEST
12253             NEXT,   GOTO-PAGE(7),                                   !BUT TABLE HERE
12254                     J/BUTMMASKPS[T]                                 !FLAG<0>L*PS<04>H IN BIT<00>
     (6251)  DCS[0.00.0.0.0.1]  BM[0110..00.11..01.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.111]
12255
12256
12257
12258
12259     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12260
12261     !* TEST 507E *
12262     !CHECK THAT INTR-HIGH-H=SERVICE(0)H*NOT(MASKED-PS[T]-H) IS LOW,
12263     !  WHEN SERVICE(0)H=HIGH, MASKED-PS[T]-H=HIGH
12264     6674:
12265     TEST507E:
12266             PO,     LOAD-ENUA(ZTARGET401),                          !BIT<01> CLEAR
12267                     LOAD-ERROR(TEST507E),                           !ERROR DIRECTORY KEY
12268                     DCS-CTR(C3.),                                   !COMPARE AT TARGET
12269                     BUMP-VERIFY,                                    !COUNT
12270             NEXT,   J/GOBUT507E                                     !
     (6674)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.011]
```

```
12271
12272    6253:  !(FREE)
12273    GOBUTS07E:
12274           SETUP,  RETURN/TEST507F,                          !RETURN TO START OF NEXT SUBTEST
12275           NEXT,   GOTO-PAGE(7),                             !BUT TABLE HERE
12276                   J/BUTINTRHIGH                             !INTR HIGH H IN BIT<01>
     (6253)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.101]
12277
12278
12279
12280    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12281
12282    !* TEST 507F *
12283    !CHECK THAT PS[C]-H CAN BE READ AS A "1" THRU D[C]←CINMUX=PS[C], AND D[C]←PS[C]
12284    !  IT WAS PREVIOUSLY CHECKED, IN ALU LOGIC TESTS, THAT THESE WERE OK WITH PS[C]="0"
12285    6647:
12286    TEST507F:
12287           P0,     LOAD-ENUA(ZTARGET407),                    !SETUP FOR SR<3:0> = "0111"
12288                   LOAD-ERROR(TEST507F),                     !ERROR DIRECTORY KEY
12289                   DCS-CTR(C7.),                             !COMPARE AT TARGET
12290           NEXT,   J/CINS07F                                 !
     (6647)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.101.100]
12291
12292    6254:  !(FREE)
12293    CINS07F:
12294           P0,     BUMP-VERIFY,                              !COUNT
12295           P2-T,   D←ZERO, D[C]←CINMUX,                      !SET D[C]=CINMUX=PS[C]=(1)
12296                   SR←ZERO,                                  !SET SR<3:0>="0000"
12297           P3,     BSPL0[17]←D,                              !B-SIDE COPY OF SR
12298           NEXT,   J/SETPS507F                               !
     (6254)  DCS[0.00.0.0.0.1]  BM[0011..00.11..00.00..011..000...0.1.1..0..0...0.0000...0..0110.0...11.000...010.101.110]
12299
12300    6256:  !(FREE)
12301    SETPS507F:
12302           P2-T,   D←A-PLUS-B-PLUS-D[C], D[C]←PS[C],          !SET D[C]=PS[C]=(1)
12303                   SR←A-PLUS-B-PLUS-D[C],                    !D, SR, BSP <- SR-LEFT-1, SR<02> <- PREV D[C] = CINMUX/PS[C]
12304                           BUS-A←SR,                         !
12305                           BUS-B←BSPL0(R17),                 !
12306           P3,     BSPL0[17]←D,                              !SAVE ON B-SIDE
12307           NEXT,   J/SETSR507F                               !
     (6256)  DCS[0.00.0.0.0.0]  BM[0100..00.11..00.00..011..001...0.1.1..0..0...0.0000...0..0110.0...11.000...010.101.111]
12308
12309    6257:  !(FREE)
12310    SETSR507F:
12311           P0,     BUMP-VERIFY,                              !COUNT
12312           P2-T,   D←A-PLUS-B-PLUS-D[C], D[C]←ALU15,         !SET D[C]=0
12313                   SR←A-PLUS-B-PLUS-D[C],                    !D, SR, BSP <- SR-LEFT-1, SR<01> <- PREV D[C] = PS[C]
12314                           BUS-A←SR,                         !
12315                           BUS-B←BSPL0(R17),                 !
12316           P3,     BSPL0[17]←D,                              !SAVE ON B-SIDE
12317           NEXT,   J/SETCIN507F                              !
     (6257)  DCS[0.00.0.0.0.1]  BM[0100..00.11..00.00..011..100...0.1.1..0..0...0.0000...0..0110.0...11.000...010.110.000]
12318
```

```
12319    6260:  !(FREE)
12320    SETCIN507F:
12321           P2-T,   D←A-PLUS-B-PLUS-PS[C], D[C]←ALU15,      !SET D[C]=0
12322                   SR←A-PLUS-B-PLUS-PS[C],                 !D, SR, BSP <- SR-LEFT-1, SR<00> <- CIN/PS[C]
12323                           BUS-A←SR,                       !
12324                           BUS-B←BSPLO(R17),               !
12325           NEXT,   J/GOBUT507F                             !
     (6260)  DCS[0.00.0.0.0.0]  BM[0001..00.11..00.00..011..100...0.1.1..0..0...0.0000...0..0000.0...11.000...010.110.001]
12326
12327    6261:  !(FREE)
12328    GOBUT507F:
12329           SETUP,  RETURN/SCOPE507,                        !RETURN TO SCOPE LOOP TEST WORD
12330           NEXT,   GOTO-PAGE(7),                           !BUT TABLE
12331                   J/BUTSR3-0                              !CHECK THAT WE GOT "0111" = (07)
     (6261)  DCS[0.00.0.0.0.0]  BM[0110..00.01..01.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.110]
12332
12333
12334
12335
12336
12337    6262:  !(FREE)
12338    SCOPE507:
12339           P0,     BUSDIN←EMIT-[I],                        !KEEP EMIT FOR CONSTANTS
12340           P2,     PS←D-[I],                               !ZERO PS; D LEFT ZERO FROM
12341                                                           !PREVIOUS TESTS IF ALL OK
12342           NEXT,   BUTD[SCOPE],                            !NO ERROR: "TEST510A" (+1. WORDS)
12343                   J/TEST510A                              !   ERROR: "EXPEC507A" (-21. WORDS)
     (6262)  DCS[0.00.0.1.0.0]  BM[1000..00.00..00.01..010..010...0.0.0..0..0...1.1011...0..0000.0...11.000...110.000.011]
12344
12345
12346
12347
12348
12349
12350    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12351
12352    !*** TEST 510 ***
12353
12354    !TESTS 510 A-F USE PS<7:5>H="111", PS<4>H="1", VARIOUS FLAG<7,0>H COMBINATIONS,
12355    !  TO TEST THE INTR-HIGH-H, SERVICE-H, AND MASKED-PS[T]-H LOGIC
12356
12357    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12358
12359    !* TEST 510A *
12360    !CHECK THAT BG-SERVICE(0)H=HIGH WHEN PS<7:5>H="111" (PSW PRIORITY 7); EG, BR>PS-H=LOW, SINCE NO
12361    !  EXTERNAL UNIBUS DEVICE CAN THEN REQUEST AN INTERRUPT (IE, IT IS MASKED OUT)
12362    6603:
12363    TEST510A:
12364           P0,     LOAD-EMUA(ZTARGET407),                  !BIT<02> SET
12365                   LOAD-ERROR(TEST510A),                   !ERROR DIRECTORY KEY
12366                   DCS-CTR(C5.),                           !COMPARE AT TARGET
12367           NEXT,   J/SETONES510A                           !
     (6603)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...110.000.110]
```

```
12368
12369    6606:
12370    SETONES510A:
12371            P2-T,   D←ALL-ONES, SAVE-D[C],                  !ALL ONES FOR LOAD PRIORITY 7
12372            NEXT,   J/LOADPRIO510A                          !
     (6606)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..101..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.110.011]
12373
12374    6263:  !(FREE)
12375    LOADPRIO510A:
12376            P0,     BUSDIN←EMIT-[I],                        !KEEP IT ON
12377            P3-T,   PS[7-4]←D[7-4]-[I],                     !PRIO 7, T-BIT (PS04) SET
12378            NEXT,   J/GOBUT510A                             !
     (6263)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..010..000...1.0.0..0..0...1.1011...0..0000.0...11.000...010.110.100]
12379
12380    6264:  !(FREE)
12381    GOBUT510A:
12382            SETUP,  RETURN/TEST510B,                        !RETURN TO START OF NEXT SUBTEST
12383            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
12384                    J/BUTBGSERVL                            !BG-SERVICE(0)H IN BIT<02>
     (6264)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.110]
12385
12386
12387
12388
12389
12390    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12391
12392    !* TEST 510B *
12393    !CHECK THAT BUT[ NOT(BG-SERVICE(0)H) + NOT(FLTPT-SERVICE-L) ] IN BIT<03>
12394    !  SEES BG-SERVICE(0)H=HIGH, FLTPT-SERVICE-L=HIGH, AND THUS IS NOT ASSERTED (=LOW)
12395    6675:
12396    TEST510B:
12397            P0,     LOAD-ENUA(ZTARGET407),                  !BIT<03> CLEAR
12398                    LOAD-ERROR(TEST510B),                   !ERROR DIRECTORY KEY
12399                    DCS-CTR(C3.),                           !COMPARE AT TARGET
12400            NEXT,   J/GOBUT510B                             !
     (6675)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.101]
12401
12402    6265:  !(FREE)
12403    GOBUT510B:
12404            SETUP,  RETURN/TEST510C,                        !RETURN TO START OF NEXT SUBTEST
12405            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
12406                    J/BUTBGFPSERV                           !RESULT IN BIT<03>
     (6265)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.111]
12407
12408
12409
12410
12411
12412    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12413
12414    !* TEST 510C *
```

```
12415    !CHECK THAT SERVICE-H=INTR-HIGH-H*BG-SERVICE(0)H*NOT(FLAG<7>H) IS HIGH,
12416    !  WHEN INTR-HIGH-H=LOW, BG-SERVICE(0)H=HIGH, FLAG<7>H=LOW
12417    6616:
12418    TEST510C:
12419            P0,     LOAD-ENUA(ZTARGET403),                  !BIT<00> SET
12420                    LOAD-ERROR(TEST510C),                   !ERROR DIRECTORY KEY
12421                    DCS-CTR(C3.),                           !COMPARE AT TARGET
12422            NEXT,   J/GOBUT510C                             !
     (6616)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.110]
12423
12424    6266:  !(FREE)
12425    GOBUT510C:
12426            SETUP,  RETURN/TEST510D,                        !RETURN TO START OF NEXT SUBTEST
12427            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
12428                    J/BUTSERVICE                            !SERVICE-H IN BIT<00>
     (6266)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.101]
12429
12430
12431
12432    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12433
12434    !* TEST 510D *
12435    !SET ONLY FLAG<0>H, FLAG<7>H, LEAVE PS<04>H SET,
12436    !CHECK MASKED-PS[T]-H=PS<04>H*FLAG<0>L IS LOW
12437    6600:
12438    TEST510D:
12439            P0,     LOAD-ENUA(ZTARGET406),                  !BIT<00> CLEAR
12440                    LOAD-ERROR(TEST510D),                   !ERROR DIRECTORY KEY
12441                    DCS-CTR(C7.),                           !COMPARE AT TARGET
12442                    BUMP-VERIFY,                            !COUNT
12443            NEXT,   J/FLAG510D                              !
     (6600)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...010.110.111]
12444
12445    6267:  !(FREE)
12446    FLAG510D:
12447            P3,     CSPD[01]←EMIT,                          !
12448                    EMIT/040401,                            !BITS FOR FLAG<7,0> ONLY, BIT<00> OF D
12449            NEXT,   J/ENFLAG510D                            !
     (6267)  DCS[0.00.0.0.0.0]  BM[0100..10.00..01.00..000..001...0.0.0..0..0...0.1110...1..0000.0...11.000...010.111.000]
12450
12451    6270:  !(FREE)
12452    ENFLAG510D:
12453            P3-T,   D←CSPD(D01), D[C]←0,                    !INTO D
12454            NEXT,   J/SETFLAG510D                           !
     (6270)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...1.1.0..0..0...0.1110...0..0000.0...11.000...010.111.001]
12455
12456    6271:  !(FREE)
12457    SETFLAG510D:
12458            P3-T,   FLAG[8-0]←D[15-8]-[I],                  !SET FLAGS<7,0>H ONLY
12459            NEXT,   J/GOBUT510D                             !
     (6271)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..001...1.0.0..0..0...1.1011...0..0000.0...11.000...010.111.010]
12460
12461    6272:  !(FREE)
```

```
12462    GOBUT510D:
12463            SETUP,  RETURN/TEST510DA,                       !RETURN TO START OF NEXT SUBTEST
12464            NEXT,   GOTO-PAGE(7),                           !BUT TABLE HERE
12465                    J/BUTMMASKPS[T]                         !FLAG<0>L*PS<04>H IN BIT<00>
     (6272)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.111]
12466
12467
12468
12469
12470    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12471
12472    !*** TEST 510DA ***
12473    !DO THE "MULTIPLE BUT" ON "D<00>H" TO CHECK IT'S SET  (DURING TEST510D, ABOVE)
12474    6617:
12475    TEST510DA:
12476            PO,     LOAD-ENUA(ZTARGET407),                  !BIT<00> SET
12477                    LOAD-ERROR(TEST510DA),                  !ERROR DIRECTORY KEY
12478                    DCS-CTR(C4.),                           !COMPARE AT TARGET
12479                    BUMP-VERIFY,                            !COUNT
12480            NEXT,   J/GOBUT510DA                            !
     (6617)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.011]
12481
12482    6273:  !(FREE)
12483    GOBUT510DA:
12484            SETUP,  RETURN/TEST510E,                        !RETURN TO START OF NEXT SUBTEST
12485            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
12486                    J/BUTMD00                               !D<00>-H IN BIT<00>
     (6273)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.010.001]
12487
12488
12489
12490
12491    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12492
12493    !* TEST 510E *
12494    !CHECK THAT SERVICE-H=INTR-HIGH-H*BG-SERVICE(0)H*NOT(FLAG<7>H) IS HIGH,
12495    !  WHEN INTR-HIGH-H=HIGH, BG-SERVICE(0)H=HIGH, FLAG<7>H=HIGH
12496    6604:
12497    TEST510E:
12498            PO,     LOAD-ENUA(ZTARGET403),                  !BIT<00> SET
12499                    LOAD-ERROR(TEST510E),                   !ERROR DIRECTORY KEY
12500                    DCS-CTR(C4.),                           !COMPARE AT TARGET
12501            NEXT,   J/ZEROD510E                             !
     (6604)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.100]
12502
12503    6274:  !(FREE)
12504    ZEROD510E:
12505            P2-T,   D←ZERO, D[C]←ALU15,                     !ZEROES FOR BELOW
12506            NEXT,   J/GOBUT510E                             !
     (6274)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..100...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.101]
12507
12508    6275:  !(FREE)
```

```
12509    GOBUT510E:
12510           PO,     BUMP-VERIFY,                                    !COUNT
12511           SETUP,  RETURN/TEST510F,                                !RETURN TO START OF NEXT SUBTEST
12512           NEXT,   GOTO-PAGE(7),                                   !BUT TABLE HERE
12513                   J/BUTSERVICE'                                   !SERVICE-H IN BIT<00>
     (6275)  DCS[0.00.0.0.0.1]  BM[0110..00.11..00.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.101]
12514
12515
12516
12517
12518    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12519
12520    !* TEST 510F *
12521    !CHECK THAT SERVICE-H=INTR-HIGH-H*BG-SERVICE(0)H*NOT(FLAG<7>H) IS LOW,
12522    !  WHEN INTR-HIGH-H=HIGH, BG-SERVICE(0)H=HIGH, FLAG<7>H=LOW
12523    6610:
12524    TEST510F:
12525           PO,     LOAD-ENUA(ZTARGET402),                          !BIT<00> CLEAR
12526                   LOAD-ERROR(TEST510F),                           !ERROR DIRECTORY KEY
12527                   DCS-CTR(C4.),                                   !COMPARE AT TARGET
12528           NEXT,   J/ZEROFLAGS10E                                  !
     (6610)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...010.111.110]
12529
12530    6276:  !(FREE)
12531    ZEROFLAGS10E:
12532           P2,     PS←D-[I],                                       !ZERO PS-T-BIT, AND ALL THE OTHERS,
12533                   FPS[7-4]←D[7-4]-[I],                            !ZERO THE FPS
12534           P3,     FLAG[8-0]←D[15-8]-[I],                          !ZERO FLAGS (D ZEROED ABOVE)
12535           NEXT,   J/GOBUT510F                                     !
     (6276)  DCS[0.00.0.0.0.0]  BM[1000..00.00..00.01..110..011...0.0.0..0..0...1.1011...0..0000.0...11.000...010.111.111]
12536
12537    6277:  !(FREE)
12538    GOBUT510F:
12539           SETUP,  RETURN/SCOPE510,                                !RETURN TO SCOPE LOOP TEST WORD
12540           NEXT,   GOTO-PAGE(7),                                   !BUT TABLE HERE
12541                   J/BUTSERVICE'                                   !SERVICE-H IN BIT<00>
     (6277)  DCS[0.00.0.0.0.0]  BM[0110..00.01..10.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.101]
12542
12543
12544
12545
12546
12547    6300:  !(FREE)
12548    SCOPE510:
12549           PO,     BUSDIN←EMIT-[I],                                !KEEP EMIT FOR CONSTANTS
12550           P2,     PS←D-[I],                                       !ZERO PS; D LEFT ZERO FROM
12551                                                                   !PREVIOUS TESTS IF ALL OK
12552           NEXT,   BUTD[SCOPE],                                    !NO ERROR: "TEST511A" (+11. WORDS)
12553                   J/TEST511A                                      !   ERROR: "SETONES510A" (-20. WORDS)
     (6300)  DCS[0.00.0.1.0.0]  BM[1000..00.00..00.01..010..010...0.0.0..0..0...1.1011...0..0000.0...11.000...110.000.111]
12554
12555
```

```
12556
12557    ! - - -
```

```
      (7101)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..010...1.0.0..0..0...1.1011...0..0000.0...11.000...001.000.010]
12605
12606    7102:  !(FREE)
12607    PSSEQL0003:
12608           P3-T,   D←CSPD(D06), D[C]←0,                    !GET VALUE TO LOAD PS<7:4>H
12609           NEXT,   J/PSSEQL0004                            !
      (7102)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...1.1.0..0..0...0.1001...0..0000.0...11.000...001.000.011]
12610
12611    7103:  !(FREE)
12612    PSSEQL0004:
12613           P0,     BUSDIN←EMIT-[I],                        !
12614           P3-T,   PS[7-4]←D[7-4]-[I],                     !LOAD PS<7:4>H FROM D<7:4>H
12615           NEXT,   J/PSSEQL0005                            !
      (7103)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..010..000...1.0.0..0..0...1.1011...0..0000.0...11.000...001.000.100]
12616
12617    7104:  !(FREE)
12618    PSSEQL0005:
12619           P3-T,   D←CSPD(D07), D[C]←0,                    !GET VALUE TO LOAD TO PS<3:0>H
12620           NEXT,   J/PSSEQL0006                            !
      (7104)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...1.1.0..0..0...0.1000...0..0000.0...11.000...001.000.101]
12621
12622    7105:  !(FREE)
12623    PSSEQL0006:
12624           P0,     BUSDIN←EMIT-[I],                        !KEEP IT ON
12625           P2-T,   PS[3-0]←D[3-0]-[I],                     !LOAD PS<3:0>H FROM D<3:0>H
12626           NEXT,   BUTA(RETURN),                           !AND RETURN
12627                   J/BUTERROR7                             !
      (7105)  DCS[0.00.0.0.0.0]  BM[1000..00.00..00.01..000..000...0.0.0..0..0...1.1011...0..0000.0...11.111...011.111.110]
12628
12629
12630
12631
12632
12633    !.PAGE=============================================================================================================
12634
12635
12636    .TOC   *   TEST511:  MFSS LOGIC TESTS
12637
12638
12639    !*****************************************************************************************************
12640    !*
12641    !*     TESTS:  511 A - B                                   UWORDS:  022 + 060
12642    !*
12643    !*     FUNCTIONS:
12644    !*
12645    !*     THE FOLLOWING TESTS VERIFY THAT THE "MF SAME STACK" LOGIC OPERATES
12646    !*     CORRECTLY, AND THAT THE "SR6-H" DECODE IS CORRECT.
12647    !*
12648    !*****************************************************************************************************
12649
12650
12651
12652    !
12653    !      SUMMARY OF "MF SAME STACK H" LOGIC TESTS
```

```
12654   !
12655   !       MF SAME STACK H = FLAG2-H * IR8-H * IR7-H * IR6-L * (PS15-H=PS13-H)-H
12656   !
12657   !       TEST    PS15,13H  FLAG2H  IR8-6H/SR6H  MFSS-H   DATA
12658   !       ----    --------  ------  -----------  ------   ------
12659   !
12660   !        A1        0-0       1       110-1        1     002601
12661   !
12662   !        A2        0-1       1       110-1        0     022600
12663   !
12664   !        A3        1-1       1       110-1        1     122601
12665   !
12666   !        A4        1-0       1       110-1        0     102600
12667   !
12668   !
12669   !        B1        0-0       0       110-1        0     000600
12670   !
12671   !        B2        0-0       1       010-0        0     002200
12672   !
12673   !        B3        0-0       1       100-0        0     002400
12674   !
12675   !        B4        0-0       1       111-0        0     002700
12676   !
12677   !
12678   !
12679   !       TESTING SUBR USED FOR ABOVE TESTS USES THE DATA AS FOLLOWS:
12680   !
12681   !       DATA<15,13> -> PS<15,13>,  DATA<10> -> FLAG<2>,
12682   !       DATA<8:6> -> IR<8:6>,  DATA<0> = EXPECTED MFSS-H OUTPUT
12683   !
12684
12685    6232:  !(FREE)
12686    MFSS01:
12687           P2-U,    IR←DBUF-[1],                          !DONT CARE ABOUT AFFECT, ONLY SET
12688           P3,      DBUF←D-[1],                           !THESE UCONS UP
12689           NEXT,    J/MFSS02                              !
    (6232)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...011.000.010]
12690
12691    6302:  !(FREE)
12692    MFSS02:
12693           P2-T,    D←CSPB(B17), D[C]←ALU00,              !GET DATA INTO D, D[C]←EXPECTED MFSS-H
12694           P2-U,    IR←DBUF,                              !IGNORE FOR NOW
12695           P3,      DBUF←D,                               !GET DATA INTO DBUF, TO GO TO IR NEXT
12696           NEXT,    J/MFSS03                              !
    (6302)  DCS[0.00.0.0.0.0]  BM[1010..11.00..00.00..000..010...0.1.0..0..0...1.1010...0..0000.0...11.000...011.000.011]
12697
12698    6303:  !(FREE)
12699    MFSS03:
12700           P0,      BUMP-VERIFY,                          !COUNT
12701           P2-U,    IR←DBUF,                              !SETUP IR<8:6> FROM DATA<8:6>
12702           P3,      DBUF←D,                               !IGNORE FOR NOW
12703           NEXT,    J/MFSS04                              !
    (6303)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.000.100]
12704
```

```
12705    6304:  !(FREE)
12706    MFSS04:
12707            P0,     BUSDIN←EMIT-[I],                        !RESET
12708            P3,     FLAG[8-0]←D[15-8]-[I],                  !SETUP FLAG<2> FROM DATA<10>
12709                    PS[15-12]←D[15#13]-[I],                 !SETUP PS<15,13> FROM D<15,13>
12710            NEXT,   BUTR(D[C]-A),                           !IF EXPECT MFSS-H=(1), J/MFSS06
12711                    J/MFSS05                                !IF EXPECT MFSS-H=(0), J/MFSS05
    (6304)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..011...0.0.0..0..0...1.1011...0..0000.0...01.111...101.101.010]
12712
12713    !* COME HERE IF EXPECT MFSS-H=(0)
12714    6552:
12715    MFSS05:
12716            P0,     LOAD-ENUA(MFSSEXPEC0),                  !SETUP FOR (0)
12717                    LOAD-ERROR(MFSS05),                     !ERROR DIRECTORY KEY
12718                    DCS-CTR(C1.),                           !COMPARE AT TARGET
12719                    BUMP-VERIFY,                            !COUNT
12720            NEXT,   BUTR(MFSS),                             !TEST MFSS:  (0)=MFSSEXPEC0, (1)=MFSSEXPEC1
12721                    J/MFSSEXPEC0                            !
    (6552)  DCS[1.00.1.0.0.1]  BM[1110..00.11..01.01..100..101...0.0.0..0..0...0.0000...0..0000.0...01.100...101.100.101]
12722
12723    !* COME HERE IF EXPECT MFSS-H=(1)
12724    6553:
12725    MFSS06:
12726            P1,     LOAD-ENUA(MFSSEXPEC1),                  !SETUP FOR (0)
12727                    LOAD-ERROR(MFSS06),                     !ERROR DIRECTORY KEY
12728                    DCS-CTR(C1.),                           !COMPARE AT TARGET
12729            NEXT,   BUTR(MFSS),                             !TEST MFSS:  (0)=MFSSEXPEC0, (1)=MFSSEXPEC1
12730                    J/MFSSEXPEC0                            !
    (6553)  DCS[1.00.1.0.0.0]  BM[1110..00.11..01.01..100..111...0.0.0..0..0...0.0000...0..0000.0...01.100...101.100.101]
12731
12732
12733    !* COME HERE IF MFSS-H TESTS AS A (0)
12734    6545:
12735    MFSSEXPEC0:
12736            P0,     BUSDIN←EMIT-[I],                        !RESET PROC UCON
12737            NEXT,   BUTA(RETURN),                           !AND RETURN
12738                    J/BUTERROR6                             !*** COMPARE DONE HERE ***
    (6545)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.111...011.111.110]
12739
12740    !* COME HERE IF MFSS-H TESTS AS A (1)
12741    6547:
12742    MFSSEXPEC1:
12743            P0,     BUSDIN←EMIT-[I],                        !RESET PROC UCON
12744            NEXT,   BUTA(RETURN),                           !AND RETURN
12745                    J/BUTERROR6                             !*** COMPARE DONE HERE ***
    (6547)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.111...011.111.110]
12746
12747    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12748
12749    !       THE TESTS ACTUALLY START HERE:
12750
12751    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12752
12753
```

```
12754    6607:
12755    TEST511A:
12756            P0,     LOAD-ERROR(TEST511A),                   !ERROR DIRECTORY KEY
12757            P3,     CSPD[17]←EMIT, EMIT/002601,             !* TEST 511 A1 DATA *
12758            NEXT,   J/GOTEST511A1                           !
     (6607)  DCS[1.00.0.0.0.0]  BM[0000..10.01..01.10..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...101.101.000]
12759
12760    6550:
12761    GOTEST511A1:
12762            SETUP,  RETURN/TEST511A2,                       !GO DO THE TEST
12763            NEXT,   CALL[MFSS-TEST]                         !
     (6550)  DCS[0.00.0.0.0.0]  BM[0111..00.00..01.11..100..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]
12764
12765
12766    7074:  !(FREE)
12767    TEST511A2:
12768            P3,     CSPD[17]←EMIT, EMIT/022600,             !* TEST 511 A2 DATA *
12769            NEXT,   J/GOTEST511A2                           !
     (7074)  DCS[0.00.0.0.0.0]  BM[0010..10.01..01.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.000.111]
12770
12771    7107:  !(FREE)
12772    GOTEST511A2:
12773            SETUP,  RETURN/TEST511A3,                       !GO DO THE TEST
12774            NEXT,   CALL[MFSS-TEST]                         !
     (7107)  DCS[0.00.0.0.0.0]  BM[0111..00.00..10.01..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]
12775
12776
12777    7110:  !(FREE)
12778    TEST511A3:
12779            P3,     CSPD[17]←EMIT, EMIT/122601,             !* TEST 511 A3 DATA *
12780            NEXT,   J/GOTEST511A3                           !
     (7110)  DCS[0.00.0.0.0.0]  BM[1010..10.01..01.10..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.001]
12781
12782    7111:  !(FREE)
12783    GOTEST511A3:
12784            SETUP,  RETURN/TEST511A4,                       !GO DO THE TEST
12785            NEXT,   CALL[MFSS-TEST]                         !
     (7111)  DCS[0.00.0.0.0.0]  BM[0111..00.00..10.01..010..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]
12786
12787
12788    7112:  !(FREE)
12789    TEST511A4:
12790            P3,     CSPD[17]←EMIT, EMIT/102600,             !* TEST 511 A4 DATA *
12791            NEXT,   J/GOTEST511A4                           !
     (7112)  DCS[0.00.0.0.0.0]  BM[1000..10.01..01.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.011]
12792
12793    7113:  !(FREE)
12794    GOTEST511A4:
12795            SETUP,  RETURN/SCOPE511A,                       !GO DO THE TEST
12796            NEXT,   CALL[MFSS-TEST]                         !
     (7113)  DCS[0.00.0.0.0.0]  BM[0110..00.01..10.00..001..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]
```

```
12797
12798
12799    6301:  !(FREE)
12800    SCOPE511A:
12801            P3,     CSPD[17]←EMIT, EMIT/002601,                !RESET DATA FOR TEST 511 A1
12802            NEXT,   BUID[SCOPE],                               !NO ERROR:  "TEST511B1" (+1. WORDS)
12803                    J/TEST511B1'                               !   ERROR:  "GOTEST511A1" (-7. WORDS)
     (6301)  DCS[0.00.0.1.0.0]  BM[0000..10.01..01.10..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...101.101.001]
12804
12805
12806
12807
12808    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12809
12810
12811    6551:
12812    TEST511B1:
12813            P3,     CSPD[17]←EMIT, EMIT/000600,                !* TEST 511 B1 DATA *
12814            NEXT,   J/GOTEST511B1                              !
     (6551)  DCS[0.00.0.0.0.0]  BM[0000..10.00..01.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...101.101.100]
12815
12816    6554:
12817    GOTEST511B1:
12818            SETUP,  RETURN/TEST511B2,                          !GO DO THE TEST
12819            NEXT,   CALL[MFSS-TEST]                            !
     (6554)  DCS[0.00.0.0.0.0]  BM[0111..00.00..10.00..110..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]
12820
12821
12822    7106:  !(FREE)
12823    TEST511B2:
12824            P3,     CSPD[17]←EMIT, EMIT/002200,                !* TEST 511 B2 DATA *
12825            NEXT,   J/GOTEST511B2                              !
     (7106)  DCS[0.00.0.0.0.0]  BM[0000..10.01..00.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.101]
12826
12827    7115:  !(FREE)
12828    GOTEST511B2:
12829            SETUP,  RETURN/TEST511B3,                          !GO DO THE TEST
12830            NEXT,   CALL[MFSS-TEST]                            !
     (7115)  DCS[0.00.0.0.0.0]  BM[0111..00.00..10.01..110..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]
12831
12832
12833    7116:  !(FREE)
12834    TEST511B3:
12835            P3,     CSPD[17]←EMIT, EMIT/002400,                !* TEST 511 B3 DATA *
12836            NEXT,   J/GOTEST511B3                              !
     (7116)  DCS[0.00.0.0.0.0]  BM[0000..10.01..01.00..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.001.111]
12837
12838    7117:  !(FREE)
12839    GOTEST511B3:
12840            SETUP,  RETURN/TEST511B4,                          !GO DO THE TEST
12841            NEXT,   CALL[MFSS-TEST]                            !
     (7117)  DCS[0.00.0.0.0.0]  BM[0111..00.00..10.10..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]
```

```
12842
12843
12844    7120:  !(FREE)
12845    TEST511B4:
12846           P3,     CSPD[17]←EMIT, EMIT/002700,                !* TEST 511 B4 DATA *
12847           NEXT,   J/GOTEST511B4                              !
     (7120)  DCS[0.00.0.0.0.0]  BM[0000..10.01..01.11..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...001.010.001]
12848
12849    7121:  !(FREE)
12850    GOTEST511B4:
12851           SETUP,  RETURN/SCOPE511B,                          !GO DO THE TEST
12852           NEXT,   CALL[MFSS-TEST]                            !
     (7121)  DCS[0.00.0.0.0.0]  BM[0110..00.01..10.00..101..110...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.010]
12853
12854
12855    6305:  !(FREE)
12856    SCOPE511B:
12857           P3,     CSPD[17]←EMIT, EMIT/000600,                !RESET DATA FOR TEST 511 B1
12858           NEXT,   BUTD[SCOPE],                               !NO ERROR:  "SETUP512A" (+1. WORDS)
12859                   J/SETUP512A                                !   ERROR:  "GOTEST511B1" (-7. WORDS)
     (6305)  DCS[0.00.0.1.0.0]  BM[0000..10.00..01.10..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...101.101.101]
12860
12861
12862
12863
12864
12865    !.PAGE=========================================================================================================
12866
12867
12868    .TOC   *   TEST512:  KT SRC/DST ADDRESSING LOGIC TESTS
12869
12870
12871
12872    !*************************************************************************************************
12873    !*
12874    !*     TESTS:  512 A - E                                  UWORDS:  044 + 062
12875    !*
12876    !*     FUNCTIONS:
12877    !*
12878    !*     THE FOLLOWING TEN TESTS VERIFY THE KT-SRC/DST-ADDRS ROM OUTPUT AND INPUT LINES
12879    !*     FUNCTION CORRECTLY, IN RESPECT TO NO STUCK ONE/ZERO CONDITIONS.
12880    !*
12881    !*************************************************************************************************
12882
12883
12884    !      KT SRC/DST LOGIC EQUATIONS:     (IMPLEMENTED IN ROM)
12885    !
12886    !      KT-SRC-ADDRS-3 =          NOT-F2.AND.SR6.AND.PS15
12887    !                        .OR.    F2.AND.SR6.AND.NOT-SM0.AND.PS15
12888    !                        .OR.    F2.AND.SR6.AND.SM0.AND.PS13.AND.NOT-FLTPT
12889    !                        .OR.    SR6.AND.PS15.AND.FLTPT
12890    !
12891    !      KT-DST-ADDRS-3 =          NOT-F1.AND.DR6.AND.PS15
```

```
12892                   .OR.    F1.AND.DR6.AND.NOT-DMO.AND.PS15
12893                   .OR.    F1.AND.DR6.AND.DMO.AND.PS13.AND.NOT-FLTPT
12894                   .OR.    DR6.AND.PS15.AND.FLTPT
12895
12896
12897       SUMMARY OF KT ASP/BSP SRC/DST STACK POINTER ADDRESSING LOGIC:
12898
12899   TEST    PS      FLAG                                                KT-SRC  KT-DST
12900   NUMB    15:13H  2:1H      IR      FLTL    SMOH    SR6H    DMOH    DR6H    ADR-H   ADR-H   HOW READ:
12901   ----    ------  ----    ------  ----    ----    ----    ----    ----    ------  ------  ------------
12902
12903    A1     1,0     1,1     172206  0       0       0       1       1       0               ASPHI[SF]=(02)
12904    A2                                                                              1       BSPHI[DF]=(16)
12905
12906    B1     0,1     1,0     070606  1       1       1       1       1               0       ASPHI[DF]=(06)
12907    B2                                                                      1               BSPHI[SF]=(16)
12908
12909    C1     0,1     1,1     134606  1       0       1       1       1               1       ASPHI[DF]=(16)
12910    C2                                                                      0               BSPHI[SF]=(06)
12911
12912    D1     1,0     0,1     160612  1       1       1       0       0       1               ASPHI[SF]=(16)
12913    D2                                                                              0       BSPHI[DF]=(02)
12914
12915    E1     1,0     1,1     150626  1       1       1       0       1               1       ASPHI[DF]=(16)
12916    E2                                                                      0               BSPHI[SF]=(06)
12917
12918
12919     - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12920
12921
12922           KT SRC/DST STACK POINTER ADDRESS MODE TEST SUBROUTINE:
12923
12924           ENTER WITH:     CSP(17) = VALUE TO GO INTO IR, TO SETUP FLTPT/SMO/SR6/DMO/DR6
12925                           CSP(16) = BIT<15,13> -> PS<15,13>
12926                                     BIT<10:09> -> FLAG<2:1>
12927                                     ** BIT<00> IS AN INTERNAL FLAG TO INDICATE WHICH REGISTER
12928                                          TO PUT IN THE SR ON EXIT:
12929                                          BIT<00> = (1) -> ASPHI[DF],  BIT<00> = (0) -> ASPHI[SF]
12930
12931
12932       7114:  !(FREE)
12933       KTSRCDST01:
12934              P2-T,    D←CSPD(D17), D[C]←0,                    !INITIAL DATA TO GO INTO IR
12935              NEXT,    J/KTSRCDST02                            !
       (7114)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...001.010.011]
12936
12937       7123:  !(FREE)
12938       KTSRCDST02:
12939              P2-U,    IR←DBUF-[I],                            !IGNORE FOR NOW
12940              P3,      DBUF←D-[I],                             !COPY IR DATA FROM D -> DBUF
12941              NEXT,    J/KTSRCDST03                            !
       (7123)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...001.010.100]
12942
12943       7124:  !(FREE)
```

```
12944    KTSRCDST03:
12945            P2-U,   IR←DBUF,                                !COPY IR DATA FROM DBUF -> IR
12946            P3-T,   D←CSPB(B16), D[C]←ALU00,                !GET PS/FLAGS/REGISTER SELECT DATA
12947            P3,     DBUF←D,                                 !D[C] = REGISTER SELECT FLAG
12948            NEXT,   J/KTSRCDST04                            !
     (7124)  DCS[0.00.0.0.0.0]  BM[1010..11.01..00.00..000..010...1.1.0..0..0...1.1010...0..0000.0...11.000...001.010.101]
12949
12950    7125:  !(FREE)
12951    KTSRCDST04:
12952            P0,     BUSDIN←EMIT-[I],                        !KEEP IT ON
12953            P3,     PS[15-12]←D[15#13]-[I],                 !SETUP PS<15,13> AS REQUIRED
12954                    FLAG[8-0]←D[15-8]-[I],                  !SETUP FLAG<2:1> AS REQUIRED
12955            NEXT,   J/KTSRCDST04B                           !
     (7125)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..011...0.0.0..0..0...1.1011...0..0000.0...11.000...001.010.110]
12956
12957    7126:  !(FREE)
12958    KTSRCDST04B:
12959                                                            !THIS WORD NEEDED FOR 1 UWORD DELAY FOR ROM TO SETTLE
12960            P2-T,   D←CSPD(C052525), SAVE-D[C],             !DATA PATTERN IN SCRATCH PAD ADDRESS [02]
12961            P3,     A#BSPHI[02]←D,                          !BIT<3:0> = (05)
12962            NEXT,   BUTR(D[C]-B),                           !KEY=(1) -> READ ASPHI[DF] -> SR
12963                    J/KTSRCDST05                            !KEY=(0) -> READ ASPHI[SF] -> SR
     (7126)  DCS[0.00.0.0.0.0]  BM[1010..10.10..00.00..101..111...0.1.0..0..0...0.0111...0..1011.0...10.011...011.011.101]
12964
12965    !ENTER HERE IF D[C] CLEAR, SF SELECTED
12966    7335:
12967    KTSRCDST05:
12968            P2-T,   SR←ASPHI[SF],                           !USE ASP/SF
12969            NEXT,   J/BUTSR3-0                              !AND NOW GO CHECK WHOM WAS READ
     (7335)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.11..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.111.110]
12970
12971    !ENTER HERE IF D[C] SET, DF SELECTED
12972    7337:
12973    KTSRCDST06:
12974            P2-T,   SR←ASPHI[DF],                           !USE ASP/DF
12975            NEXT,   J/BUTSR3-0                              !AND NOW GO CHECK WHOM WAS READ
     (7337)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.10..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.111.110]
12976
12977
12978    !* WE ALSO NEED TWO ENTRY POINTS TO READ BSP SF & DF:
12979
12980    7127:  !(FREE)
12981    KTSRCDST07:
12982            P2-T,   SR←BSPHI[SF],                           !USE BSP/SF
12983            NEXT,   J/BUTSR3-0                              !AND NOW GO CHECK WHOM WAS READ
     (7127)  DCS[0.00.0.0.0.0]  BM[1010..01.01..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.111.110]
12984
12985
12986    7130:  !(FREE)
12987    KTSRCDST08:
12988            P2-T,   SR←BSPHI[DF],                           !USE BSP/DF
12989            NEXT,   J/BUTSR3-0                              !AND NOW GO CHECK WHOM WAS READ
     (7130)  DCS[0.00.0.0.0.0]  BM[1010..01.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.111.110]
12990
```

```
12991
12992     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12993
12994     !      *** KT SRC/DST ENTERS HERE ***
12995
12996     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
12997
12998
12999     !THESE FIRST TWO WORDS DO SOME PRELIMINAR SETUP OF SCRATCHPAD LOCATIONS (06)/(16)
13000     6555:
13001     SETUPS12A:
13002             P2-T,    D←CSPD(C125252), D[C]←0,                    !
13003             P3,      A#BSPHI[06]←D,                              !KERNAL SP LOCATION:
13004             NEXT,    J/SETUPS12B                                 !  BIT<3:0> = (12) = SP-ADDRESS(06)
      (6555)  DCS[0.00.0.0.0.0]  BM[1010..10.10..00.00..111..000...0.1.0..0..0...0.0110...0..1011.0...11.000...011.000.1111]
13005
13006     6307:  !(FREE)
13007     SETUPS12B:
13008             P2-T,    D←CSPD(C000000), D[C]←0,                    !
13009             P3,      A#BSPHI[16]←D,                              !USER SP LOCATION:
13010             NEXT,    J/TEST512A1                                 !  BIT<3:0> = (00) = SP-ADDRESS(16)
      (6307)  DCS[0.00.0.0.0.0]  BM[1010..10.10..00.00..011..000...0.1.0..0..0...0.0100...0..1011.0...11.000...101.100.010]
13011
13012                                                                 !A,BSPHI[02] = (052525)
13013                                                                 !  BIT<3:0> = (05) = SP-ADDRESS(02)
13014
13015                                                                 !A,BSPHI[12] = (000152)
13016                                                                 !  BIT<3:0> = (12) = SP-ADDRESS(12)
13017                                                                 !  (NOT USED UNLESS ERROR)
13018
13019
13020     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13021
13022     !* TEST 512 A1 *
13023
13024     !      TEST 512 A 1-2 SETS UP FOR:  ASP-SF-ADDRESS=(02), BSP-DF-ADDRESS=(16)
13025     6542:
13026     TEST512A1:
13027             P0,      LOAD-EMUA(ZTARGET405),                      !BIT<3:0> = (05) = SP-ADDRESS(02)
13028                      LOAD-ERROR(TEST512A1),                      !ERROR DIRECTORY KEY
13029                      DCS-CTR(C11.),                              !COMPARE AT TARGET
13030             NEXT,    J/SETIRS12A1                                !
      (6542)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.100]
13031
13032     6564:
13033     SETIRS12A1:
13034             P0,      BUMP-VERIFY,                                !COUNT
13035             P3,      CSPD[17]←EMIT, EMIT/172206,                 !SETUP IR:  FLTPT/SM0/SR6/DM0/DR6
13036             NEXT,    J/SETPSFLAGS12A1                            !
      (6564)  DCS[0.00.0.0.0.1]  BM[1111..10.01..00.10..000..110...0.0.0..0..0...0.0000...1..0000.0...11.000...011.001.000]
13037
13038     6310:  !(FREE)
13039     SETPSFLAGS12A1:
13040             P3,      CSPD[16]←EMIT, EMIT/103000,                 !BIT<15,13> -> PS<15,13>,
```

```
13041                                                                   !BIT<10:9>  -> FLAGS<2:1>
13042                NEXT,   J/GOTEST512A1                              !BIT<00> IS REGISTER KEY (SEE SUBR)
     (6310)  DCS[0.00.0.0.0.0]  BM[1000..10.01..10.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...011.001.001]
13043
13044      6311:  !(FREE)
13045      GOTEST512A1:
13046                SETUP,  RETURN/TEST512A2,                          !GO EXEC KT SRC/DST TEST SUBR AT
13047                NEXT,   CALL[KTSRCDST]                             !  INITIALIZATION POINT
     (6311)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.001.100]
13048
13049
13050
13051      !* TEST 512A2 NOW READS THE COMPLEMENTARY REGISTER TO THAT USED IN TEST512A1, INTO THE SR
13052      6544:
13053      TEST512A2:
13054                PO,     LOAD-ENUA(ZTARGET400),                     !BIT<3:0> = (00) = SP-ADDRESS(16)
13055                        LOAD-ERROR(TEST512A2),                     !ERROR DIRECTORY KEY
13056                        DCS-CTR(C4.),                              !COMPARE AT TARGET
13057                NEXT,   J/GOTEST512A2                              !
     (6544)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.001.010]
13058
13059      6312:  !(FREE)
13060      GOTEST512A2:
13061                SETUP,  RETURN/SCOPE512A,                          !READ REGISTER BSPHI[DF] TO SR,
13062                NEXT,   CALL[KTDSTBSP]                             !  THEN DO BUT(SR3-0)
     (6312)  DCS[0.00.0.0.0.0]  BM[0110..00.01..10.01..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.011.000]
13063
13064
13065      6313:  !(FREE)
13066      SCOPE512A:
13067                PO,     BUSDIN←EMIT-[I],                           !RESET PROC UCON
13068                        EN-CLK-IR[15-00],                          !
13069                NEXT,   BUTD[SCOPE],                               !NO ERROR:  "TEST512B1"  (+1. WORDS)
13070                        J/TEST512B1                                !   ERROR:  "SETIR512A1"  (-5. WORDS)
     (6313)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.110.101]
13071
13072
13073
13074
13075      ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13076
13077      !* TEST 512 B1 *
13078
13079      !       TEST 512 B 1-2 SETS UP FOR:  ASP-DF-ADDRESS=(06), BSP-SF-ADDRESS=(16)
13080      6565:
13081      TEST512B1:
13082                PO,     LOAD-ENUA(ZTARGET412),                     !BIT<3:0> = (12) = SP-ADDRESS(06)
13083                        LOAD-ERROR(TEST512B1),                     !ERROR DIRECTORY KEY
13084                        DCS-CTR(C11.),                             !COMPARE AT TARGET
13085                NEXT,   J/SETIR512B1                               !
     (6565)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.110]
13086
```

```
13087    6536:
13088    SETIR51281:
13089            PO,     BUMP-VERIFY,                                    !COUNT
13090            P3,     CSPD[17]←EMIT, EMIT/070606,                     !SETUP IR:  FLTPT/SMO/SR6/DMO/DR6
13091            NEXT,   J/SETPSFLAG51281                                !
     (6536)  DCS[0.00.0.0.0.1]  BM[0111..10.00..01.10..000..110...0.0.0..0..0...0.0000...1..0000.0...11.000...011.001.100]
13092
13093    6314:  !(FREE)
13094    SETPSFLAG51281:
13095            P3,     CSPD[16]←EMIT, EMIT/022001,                     !BIT<15,13> -> PS<15,13>,
13096                                                                    !BIT<10:9>  -> FLAGS<2:1>
13097            NEXT,   J/GOTEST51281                                   !BIT<00> IS REGISTER KEY (SEE SUBR)
     (6314)  DCS[0.00.0.0.0.0]  BM[0010..10.01..00.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...011.001.101]
13098
13099    6315:  !(FREE)
13100    GOTEST51281:
13101            SETUP,  RETURN/TEST51282,                               !GO EXEC KT SRC/DST TEST SUBR AT
13102            NEXT,   CALL[KTSRCDST]                                  !  INITIALIZATION POINT
     (6315)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.001.100]
13103
13104
13105
13106    !* TEST 51282 NOW READS THE COMPLEMENTARY REGISTER TO THAT USED IN TEST51281, INTO THE SR
13107    6546:
13108    TEST51282:
13109            PO,     LOAD-ENUA(ZTARGET400),                          !BIT<3:0> = (00) = SP-ADDRESS(16)
13110                    LOAD-ERROR(TEST51282),                          !ERROR DIRECTORY KEY
13111                    DCS-CTR(C4.),                                   !COMPARE AT TARGET
13112            NEXT,   J/GOTEST51282                                   !
     (6546)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.001.110]
13113
13114    6316:  !(FREE)
13115    GOTEST51282:
13116            SETUP,  RETURN/TEST512C1,                               !READ REGISTER BSPHI[SF] TO SR,
13117            NEXT,   CALL[KTSRCBSP]                                  !  THEN DO BUT(SR3-0)
     (6316)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.111]
13118
13119
13120
13121
13122
13123
13124    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13125
13126    !* TEST 512 C1 *
13127
13128    !       TEST 512 C 1-2 SETS UP FOR:  ASP-DF-ADDRESS=(16), BSP-SF-ADDRESS=(06)
13129    6556:
13130    TEST512C1:
13131            PO,     LOAD-ENUA(ZTARGET400),                          !BIT<3:0> = (00) = SP-ADDRESS(16)
13132                    LOAD-ERROR(TEST512C1),                          !ERROR DIRECTORY KEY
13133                    DCS-CTR(C11.),                                  !COMPARE AT TARGET
```

```
13134            NEXT,   J/SETIR512C1                                   !
     (6556)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.001.111]
13135
13136     6317:  !(FREE)
13137     SETIR512C1:
13138            PO,     BUMP-VERIFY,                                   !COUNT
13139            P3,     CSPD[17]←EMIT, EMIT/134606,                    !SETUP IR:  FLTPT/SMO/SR6/DMO/DR6
13140            NEXT,   J/SETPSFLAG512C1                               !
     (6317)  DCS[0.00.0.0.0.1]  BM[1011..10.10..01.10..000..110...0.0.0..0..0...0.0000...1..0000.0...11.000...011.010.000]
13141
13142     6320:  !(FREE)
13143     SETPSFLAG512C1:
13144            P3,     CSPD[16]←EMIT, EMIT/023001,                    !BIT<15,13> -> PS<15,13>,
13145                                                                   !BIT<10:9>  -> FLAGS<2:1>
13146            NEXT,   J/GOTEST512C1                                  !BIT<00> IS REGISTER KEY (SEE SUBR)
     (6320)  DCS[0.00.0.0.0.0]  BM[0010..10.01..10.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...011.010.001]
13147
13148     6321:  !(FREE)
13149     GOTEST512C1:
13150            SETUP,  RETURN/TEST512C2,                              !GO EXEC KT SRC/DST TEST SUBR AT
13151            NEXT,   CALL[KTSRCDST]                                 !  INITIALIZATION POINT
     (6321)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.001.100]
13152
13153
13154
13155     !* TEST 512C2 NOW READS THE COMPLEMENTARY REGISTER TO THAT USED IN TEST512C1, INTO THE SR
13156     6566:
13157     TEST512C2:
13158            PO,     LOAD-ENUA(ZTARGET412),                         !BIT<3:0> = (12) = SP-ADDRESS(06)
13159                    LOAD-ERROR(TEST512C2),                         !ERROR DIRECTORY KEY
13160                    DCS-CTR(C4.),                                  !COMPARE AT TARGET
13161            NEXT,   J/GOTEST512C2                                  !
     (6566)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.010]
13162
13163     6322:  !(FREE)
13164     GOTEST512C2:
13165            SETUP,  RETURN/SCOPE512C,                              !READ REGISTER BSPHI[SF] TO SR,
13166            NEXT,   CALL[KTSRCBSP]                                 !  THEN DO BUT(SR3-0)
     (6322)  DCS[0.00.0.0.0.0]  BM[0110..00.01..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.111]
13167
13168
13169     6323:  !(FREE)
13170     SCOPE512C:
13171            PO,     BUSDIN←EMIT-[I],                               !RESET PROC UCON
13172                    EN-CLK-IR[15-00],                              !
13173            NEXT,   BUTD[SCOPE],                                   !NO ERROR:  "TEST512D1"  (+1. WORDS)
13174                    J/TEST512D1'                                   !   ERROR:  "SETIR512B1"  (-11. WORDS)
     (6323)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.011.111]
13175
13176
13177
13178
```

```
13179    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13180
13181    !* TEST 512 D1 *
13182
13183    !      TEST 512 D 1-2 SETS UP FOR:  ASP-SF-ADDRESS=(16), BSP-DF-ADDRESS=(02)
13184    6537:
13185    TEST512D1:
13186            PO,     LOAD-ENUA(ZTARGET400),                  !BIT<3:0> = (00) = SP-ADDRESS(16)
13187                    LOAD-ERROR(TEST512D1),                  !ERROR DIRECTORY KEY
13188                    DCS-CTR(C11.),                          !COMPARE AT TARGET
13189            NEXT,   J/SETIR512D1                            !
     (6537)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.110]
13190
13191    6626:
13192    SETIR512D1:
13193            PO,     BUMP-VERIFY,                            !COUNT
13194            P3,     CSPD[17]←EMIT, EMIT/160612,             !SETUP IR:  FLTPT/SM0/SR6/DM0/DR6
13195            NEXT,   J/SETPSFLAG512D1                        !
     (6626)  DCS[0.00.0.0.0.1]  BM[1110..10.00..01.10..001..010...0.0.0..0..0...0.0000...1..0000.0...11.000...011.010.100]
13196
13197    6324:  !(FREE)
13198    SETPSFLAG512D1:
13199            P3,     CSPD[16]←EMIT, EMIT/101000,             !BIT<15,13> -> PS<15,13>,
13200                                                            !BIT<10:9>  -> FLAGS<2:1>
13201            NEXT,   J/GOTEST512D1                           !BIT<00> IS REGISTER KEY (SEE SUBR)
     (6324)  DCS[0.00.0.0.0.0]  BM[1000..10.00..10.00..000..000...0.0.0..0..0...0.0001...1..0000.0...11.000...011.010.101]
13202
13203    6325:  !(FREE)
13204    GOTEST512D1:
13205            SETUP,  RETURN/TEST512D2,                       !GO EXEC KT SRC/DST TEST SUBR AT
13206            NEXT,   CALL[KTSRCDST]                          !  INITIALIZATION POINT
     (6325)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.001.100]
13207
13208
13209
13210    !* TEST 512D2 NOW READS THE COMPLEMENTARY REGISTER TO THAT USED IN TEST512D1, INTO THE SR
13211    6576:
13212    TEST512D2:
13213            PO,     LOAD-ENUA(ZTARGET405),                  !BIT<3:0> = (05) = SP-ADDRESS(02)
13214                    LOAD-ERROR(TEST512D2),                  !ERROR DIRECTORY KEY
13215                    DCS-CTR(C4.),                           !COMPARE AT TARGET
13216            NEXT,   J/GOTEST512D2                           !
     (6576)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.110]
13217
13218    6326:  !(FREE)
13219    GOTEST512D2:
13220            SETUP,  RETURN/TEST512E1,                       !READ REGISTER BSPHI[DF] TO SR,
13221            NEXT,   CALL[KTDSTBSP]                          !  THEN DO BUT(SR3-0)
     (6326)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.011.000]
13222
13223
13224
```

```
13225
13226
13227
13228    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13229
13230    !* TEST 512 E1 *
13231
13232    !       TEST 512 E 1-2 SETS UP FOR:  ASP-DF-ADDRESS=(16), BSP-SF-ADDRESS=(06)
13233    6577:
13234    TEST512E1:
13235            P0,     LOAD-ENUA(ZTARGET400),                  !BIT<3:0> = (00) = SP-ADDRESS(16)
13236                    LOAD-ERROR(TEST512E1),                  !ERROR DIRECTORY KEY
13237                    DCS-CTR(C11.),                          !COMPARE AT TARGET
13238            NEXT,   J/SETIR512E1                            !
     (6577)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.111]
13239
13240    6327:  !(FREE)
13241    SETIR512E1:
13242            P0,     BUMP-VERIFY,                            !COUNT
13243            P3,     CSPD[17]←EMIT, EMIT/150626,             !SETUP IR:  FLTPT/SM0/SR6/DM0/DR6
13244            NEXT,   J/SETPSFLAG512E1                        !
     (6327)  DCS[0.00.0.0.0.1]  BM[1101..10.00..01.10..010..110...0.0.0..0..0...0.0000...1..0000.0...11.000...011.011.000]
13245
13246    6330:  !(FREE)
13247    SETPSFLAG512E1:
13248            P3,     CSPD[16]←EMIT, EMIT/103001,             !BIT<15,13> -> PS<15,13>,
13249                                                            !BIT<10:9>  -> FLAGS<2:1>
13250            NEXT,   J/GOTEST512E1                           !BIT<00> IS REGISTER KEY (SEE SUBR)
     (6330)  DCS[0.00.0.0.0.0]  BM[1000..10.01..10.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...011.011.001]
13251
13252    6331:  !(FREE)
13253    GOTEST512E1:
13254            SETUP,  RETURN/TEST512E2,                       !GO EXEC KT SRC/DST TEST SUBR AT
13255            NEXT,   CALL[KTSRCDST]                          !  INITIALIZATION POINT
     (6331)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.001.100]
13256
13257
13258
13259    !* TEST 512E2 NOW READS THE COMPLEMENTARY REGISTER TO THAT USED IN TEST512E1, INTO THE SR
13260    6535:
13261    TEST512E2:
13262            P0,     LOAD-ENUA(ZTARGET412),                  !BIT<3:0> = (12) = SP-ADDRESS(06)
13263                    LOAD-ERROR(TEST512E2),                  !ERROR DIRECTORY KEY
13264                    DCS-CTR(C4.),                           !COMPARE AT TARGET
13265            NEXT,   J/GOTEST512E2                           !
     (6535)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.010]
13266
13267    6332:  !(FREE)
13268    GOTEST512E2:
13269            SETUP,  RETURN/SCOPE512E,                       !READ REGISTER BSPHI[SF] TO SR,
13270            NEXT,   CALL[KTSRCBSP]                          !  THEN DO BUT(SR3-0)
     (6332)  DCS[0.00.0.0.0.0]  BM[0110..00.01..10.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.111]
```

```
13271
13272
13273
13274    6333:  !(FREE)
13275    SCOPE512E:
13276           PO,     BUSDIN←EMIT-[I],                          !RESET PROC UCON
13277                   EN-CLK-IR[15-00],                         !
13278           NEXT,   BUTD[SCOPE],                              !NO ERROR:  "TEST520A"  (+1. WORDS)
13279                   J/TEST520A                                !   ERROR:  "SETIR512D1"  (-11. WORDS)
    (6333)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.010.111]
13280
13281
13282
13283
13284
13285    !.PAGE=========================================================================================================
13286
13287
13288    .TOC   *   TEST520A-520E:  TESTING THE "INSTR BRANCH" ROM
13289
13290    !*************************************************************************************
13291    !*
13292    !*     TESTS:  520A - 520E                                  UWORDS: 020 + 031
13293    !*
13294    !*     FUNCTIONS:
13295    !*
13296    !*     THE FOLLOWING FIVE TESTS VERIFY THE VALIDITY OF THE INSTRUCTION BRANCH ROM
13297    !*     INPUTS AND OUTPUTS, IN REGARD TO NO STUCK ONE/ZERO CONDITIONS.
13298    !*
13299    !*************************************************************************************
13300
13301
13302    !      SUMMARY OF INSTR BRANCH ROM TESTS:
13303    !
13304    !      TEST    IR<15,10:08>H   B-- ?   ON:                      PS<3:0>H        INSTR BRANCH L
13305    !      NUMB                                                     N Z V C
13306    !
13307    !      520A    1 0 1 0         BHI     C.IOR.Z=0                0 1 0 0         1, NEGATED
13308    !      520B    0 1 1 0         BGT     Z.IOR.(N.XOR.V)=0        0 0 0 0         0, ASSERTED
13309    !      520C    0 1 0 1         BLT     N.XOR.V=1                1 1 1 0         1, NEGATED
13310    !      520D    1 0 1 1         BLOS    C.IOR.Z=1                0 0 0 1         0, ASSERTED
13311    !      520E    1 1 1 1         BLO     C=1                      0 1 1 0         1, NEGATED
13312    !
13313
13314
13315
13316    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13317
13318    !*** TEST 520A ***
13319    !TEST-520-A SETS UP IR<15,10:08>H="1010", PS<3:0>H="0100",
13320    !  AND THEN BUTS ON "INSTR BRANCH L"
13321    6627:
13322    TEST520A:
13323           PO,     LOAD-ENUA(ZTARGET403),                    !NOT ASSERTED
```

```
13324                   LOAD-ERROR(TEST520A),                   !ERROR DIRECTORY KEY
13325                   DCS-CTR(C8.),                           !COMPARE ENUA:TNUA AT TARGET
13326           NEXT,   J/UCON520A                              !
    (6627)  DCS[1.00.1.0.0.0]  BM[0111..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...110.010.100]
13327
13328   6624:
13329   UCON520A:
13330           SELECT, UCON-PROC,                              !PROCESSOR UCON:
13331           ENABLE, BUSDIN←EMIT[15-00],                     !  EMIT ON BUSDIN
13332                   EN-CLK-IR[15-00],                       !  AND CLOCKING IR
13333           PO,     BUMP-VERIFY,                            !COUNT
13334                   SET-UCON-CONTROL,                       !WRITE CONTROLS
13335           NEXT,   J/SETUP520A                             !
    (6624)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...011.011.100]
13336
13337   6334:  !(FREE)
13338   SETUP520A:
13339           PO,     BUMP-VERIFY,                            !COUNT
13340           EMITC,  EMIT/101004,                            !PS<3:0>H="0100"
13341           P2-U,   IR←EMIT,                                !
13342           P3,     CSPD[05]←EMIT,                          !IR<15,10:08>H="1010"
13343           NEXT,   J/GOTEST520A                            !
    (6334)  DCS[0.00.0.0.0.1]  BM[1000..10.00..10.00..000..100...0.0.0..0..0...1.1010...1..0000.0...11.000...011.011.101]
13344
13345   6335:  !(FREE)
13346   GOTEST520A:
13347           SETUP,  RETURN/TEST520B,                        !RETURN TO START OF NEXT SUBTEST
13348           NEXT,   GOTO-PAGE(7),                           !GO TO CODE THAT LOADS PS[CC], AND
13349                   J/SUCBRTEST01                           !  THEN BUTS ON THE "INSTR BRANCH" ROM OUTPUT
    (6335)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.010]
13350
13351
13352
13353
13354   !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
13355
13356   !*** TEST 5208 ***
13357   !TEST-520-B SETS UP IR<15,10:08>H="0110", PS<3:0>H="0000",
13358   !  AND THEN BUTS ON "INSTR BRANCH L"
13359   6764:
13360   TEST5208:
13361           PO,     LOAD-ENUA(ZTARGET402),                  !ASSERTED
13362                   LOAD-ERROR(TEST5208),                   !ERROR DIRECTORY KEY
13363                   DCS-CTR(C7.),                           !COMPARE ENUA:TNUA AT TARGET
13364           NEXT,   J/SETUP5208                             !
    (6764)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.110]
13365
13366   6336:  !(FREE)
13367   SETUP5208:
13368           EMITC,  EMIT/003000,                            !PS<3:0>H="0000"
13369           P2-U,   IR←EMIT,                                !
13370           P3,     CSPD[05]←EMIT,                          !IR<15,10:08>H="0110"
13371           NEXT,   J/GOTEST5208                            !
```

```
      (6336)  DCS[0.00.0.0.0.0]  BM[0000..10.01..10.00..000..000...0.0.0..0..0...1.1010...1..0000.0...11.000...011.011.111]
13372
13373    6337:  !(FREE)
13374    GOTEST520B:
13375           SETUP,  RETURN/TEST520C,                        !RETURN TO START OF NEXT SUBTEST
13376           NEXT,   GOTO-PAGE(7),                           !GO TO CODE THAT LOADS PS[CC], AND
13377                   J/SUCBRTEST0]                           !  THEN BUTS ON THE "INSTR BRANCH" ROM OUTPUT
      (6337)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.010]
13378
13379
13380
13381
13382    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13383
13384    !*** TEST 520C ***
13385    !TEST-520-C SETS UP IR<15,10:08>H="0101", PS<3:0>H="1110",
13386    !  AND THEN BUTS ON "INSTR BRANCH L"
13387    6772:
13388    TEST520C:
13389           PO,     LOAD-ENUA(ZTARGET403),                  !NEGATED
13390                   LOAD-ERROR(TEST520C),                   !ERROR DIRECTORY KEY
13391                   DCS-CTR(C7.),                           !COMPARE ENUA:TNUA AT TARGET
13392                   BUMP-VERIFY,                            !COUNT
13393           NEXT,   J/SETUP520C                             !
      (6772)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.000]
13394
13395    6340:  !(FREE)
13396    SETUP520C:
13397           EMITC,  EMIT/002416,                            !PS<3:0>H="1110"
13398           P2-U,   IR←EMIT,                                !
13399           P3,     CSPD[05]←EMIT,                          !IR<15,10:08>H="0101"
13400           NEXT,   J/GOTEST520C                            !
      (6340)  DCS[0.00.0.0.0.0]  BM[0000..10.01..01.00..001..110...0.0.0..0..0...1.1010...1..0000.0...11.000...011.100.001]
13401
13402    6341:  !(FREE)
13403    GOTEST520C:
13404           SETUP,  RETURN/TEST520D,                        !RETURN TO START OF NEXT SUBTEST
13405           NEXT,   GOTO-PAGE(7),                           !GO TO CODE THAT LOADS PS[CC], AND
13406                   J/SUCBRTEST0]                           !  THEN BUTS ON THE "INSTR BRANCH" ROM OUTPUT
      (6341)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.010]
13407
13408
13409
13410
13411    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13412
13413    !*** TEST 520D ***
13414    !TEST-520-D SETS UP IR<15,10:08>H="1011", PS<3:0>H="0001",
13415    !  AND THEN BUTS ON "INSTR BRANCH L"
13416    6762:
13417    TEST520D:
13418           PO,     LOAD-ENUA(ZTARGET402),                  !ASSERTED
```

```
13419                   LOAD-ERROR(TEST520D),                   !ERROR DIRECTORY KEY
13420                   DCS-CTR(C7.),                           !COMPARE ENUA:TNUA AT TARGET
13421           NEXT,   J/SETUP520D                             !
     (6762)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.010]
13422
13423     6342:  !(FREE)
13424     SETUP520D:
13425           EMITC,  EMIT/101401,                            !PS<3:0>H="0001"
13426           P2-U,   IR←EMIT,                                !
13427           P3,     CSPD[05]←EMIT,                          !IR<15,10:08>H="1011"
13428           NEXT,   J/GOTEST520D                            !
     (6342)  DCS[0.00.0.0.0.0]  BM[1000..10.00..11.00..000..001...0.0.0..0..0...1.1010...1..0000.0...11.000...011.100.011]
13429
13430     6343:  !(FREE)
13431     GOTEST520D:
13432           SETUP,  RETURN/TEST520E,                        !RETURN TO START OF NEXT SUBTEST
13433           NEXT,   GOTO-PAGE(7),                           !GO TO CODE THAT LOADS PS[CC], AND
13434                   J/SUCBRTEST01                           !  THEN BUTS ON THE "INSTR BRANCH" ROM OUTPUT
     (6343)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.010]
13435
13436
13437
13438
13439     !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13440
13441     !*** TEST 520E ***
13442     !TEST-520-E SETS UP IR<15,10:08>H="1111", PS<3:0>H="0110",
13443     !  AND THEN BUTS ON "INSTR BRANCH L"
13444     6775:
13445     TEST520E:
13446           PO,     LOAD-ENUA(ZTARGET403),                   !NEGATED
13447                   LOAD-ERROR(TEST520E),                   !ERROR DIRECTORY KEY
13448                   DCS-CTR(C7.),                           !COMPARE ENUA:TNUA AT TARGET
13449           NEXT,   J/SETUP520E                             !
     (6775)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.100]
13450
13451     6344:  !(FREE)
13452     SETUP520E:
13453           PO,     BUMP-VERIFY,                            !COUNT
13454           EMITC,  EMIT/103406,                            !PS<3:0>H="0110"
13455           P2-U,   IR←EMIT,                                !
13456           P3,     CSPD[05]←EMIT,                          !IR<15,10:08>H="1111"
13457           NEXT,   J/GOTEST52GE                            !
     (6344)  DCS[0.00.0.0.0.1]  BM[1000..10.01..11.00..000..110...0.0.0..0..0...1.1010...1..0000.0...11.000...011.100.101]
13458
13459     6345:  !(FREE)
13460     GOTEST520E:
13461           SETUP,  RETURN/SCOPE520,                        !RETURN TO SCOPE LOOP TEST WORD
13462           NEXT,   GOTO-PAGE(7),                           !GO TO CODE THAT LOADS PS[CC], AND
13463                   J/SUCBRTEST01                           !  THEN BUTS ON THE "INSTR BRANCH" ROM OUTPUT
     (6345)  DCS[0.00.0.0.0.0]  BM[0110..00.01..11.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.010.010]
13464
```

```
13465
13466
13467
13468    6346:  !(FREE)
13469    SCOPES20:
13470            PO,     BUSDIN←EMIT-[I],                        !RESET PROC UCONS
13471                    EN-CLK-IR[15-00],                       !
13472            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST533A"  [+4. WORDS]
13473                    J/TEST533A                              !   ERROR:  "UCON520A"  [-15. WORDS]
    (6346)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.010.101]
13474
13475
13476
13477    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13478
13479    !       TESTING SUBR (COMMON CODE) FOR ABOVE TESTS
13480
13481    7122:  !(FREE)
13482    SUCBRTEST01:
13483            P2-T,   D←CSPD(005), D[C]←0,                    !GET PATTERN
13484            NEXT,   J/SUCBRTEST02                           !
    (7122)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.1010...0..0000.0...11.000...001.011.010]
13485
13486    7132:  !(FREE)
13487    SUCBRTEST02:
13488            P2-T,   PS[3-0]←D[3-0]-[I],                     !INTO PS[CC]
13489            NEXT,   J/SUCBRTEST03                           !
    (7132)  DCS[0.00.0.0.0.0]  BM[1000..00.00..00.01..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...001.011.011]
13490
13491    7133:  !(FREE)
13492    SUCBRTEST03:
13493            SELECT, UCON-PROC,                              !LEAVE WITH EMIT ON BUSDIN,
13494            ENABLE, BUSDIN←EMIT[15-00],                     !  CLOCK IR ENABLED
13495                    EN-CLK-IR[15-00],                       !
13496            PO,     SET-UCON-CONTROL,                       !WRITE CONTROLS
13497            NEXT,   J/BUTINSTRBRANCH                        !
    (7133)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...011.101.110]
13498
13499
13500
13501
13502
13503    !.PAGE==========================================================================================================
13504
13505
13506    .TOC   *   TEST533-537:  SHIFT TREE
13507
13508    !**************************************************************************************************
13509    !*
13510    !*      TESTS:  533A - 537A                                     UWORDS: 170 + 044
13511    !*
13512    !*      FUNCTIONS:      TESTS 533A - 537A VERIFY THE DATA AND CONTROL PATHS
13513    !*                      OF THE 3 LEVEL BARREL SHIFTER (SHIFT TREE).
13514    !*
```

```
13515    !*************************************************************************************
13516
13517
13518
13519
13520
13521
13522    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13523
13524    !*** TEST 533A ***
13525    !READ D DIRECTLY THRU "D[HI]#D[LO]" PORT OF AMUX[HI#LO], BMUX-CMUX/DIRECT
13526    !IN(0)(052652), OUT(052652)
13527    6625:
13528    TEST533A:
13529            P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D = ZERO TEST
13530                    LOAD-ERROR(TEST533A),                   !ERROR DIRECTORY KEY
13531                    DCS-CTR(C6.),                           !COMPARE AT TARGET
13532            NEXT,   J/INIT533A                              !
    (6625)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.110]
13533
13534    6666:
13535    INIT533A:
13536            P0,     BUMP-VERIFY,                            !COUNT
13537            P3,     CSPD[17]←EMIT,                          !GET INITIAL PATTERN FOR D
13538                    EMIT/052652,                            !"0101 0101 1010 1010"
13539            NEXT,   J/INITD533A                             !
    (6666)  DCS[0.00.0.0.0.1]  BM[0101..10.01..01.10..101..010...0.0.0..0..0...0.0000...1..0000.0...11.000...011.100.111]
13540
13541    6347:  !(FREE)
13542    INITD533A:
13543            P2-T,   D←CSPD(D17),                            !INITIAL D =(052652)
13544                    D[C]←ALU15,                             !SETUP D[C] FOR SHIFT = "0"
13545            NEXT,   J/COMP533A                              !
    (6347)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.0..0..0...0.0000...0..0000.0...11.000...011.101.000]
13546
13547    6350:  !(FREE)
13548    COMP533A:
13549            P0,     BUMP-VERIFY,                            !COUNT
13550            SETUP,  D-DIRECT,                               !AMUX-BMUX-CMUX ALL DIRECT
13551            P2-T,   D←D-SHIFTED-XOR-CSPB(B17),              !COMPARE D-SHIFTED:EXPECTED, BITWISE
13552            NEXT,   J/GOBUT533A                             !EXPECTED =(052652)
    (6350)  DCS[0.00.0.0.0.1]  BM[0110..11.00..01.01..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.101.001]
13553
13554    6351:  !(FREE)
13555    GOBUT533A:
13556            SETUP,  RETURN/TEST533B,                        !RETURN TO START OF NEXT SUBTEST
13557            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
13558                    J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
    (6351)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
13559
13560
13561
13562
```

```
13563    ! - - -
```

```
13610
13611     !*** TEST 534A ***
13612     !READ D THRU "D[LO]#D[HI]" PORT OF AMUX[HI,LO], BMUX-CMUX/DIRECT
13613     !IN(D)(052652), OUT(125125)
13614     6667:
13615     TEST534A:
13616               P0,     LOAD-ENUA(ZTARGET402),                    !SETUP FOR D=ZERO TEST
13617                       LOAD-ERROR(TEST534A),                     !ERROR DIRECTORY KEY
13618                       DCS-CTR(CS.),                             !COMPARE AT TARGET
13619               P3,     BUTA(CLR-FLAG-RES-UCON),                  !EMIT ON BUSDIN
13620               NEXT,   J/INITD534A                               !
     (6667)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.010...110.110.100]
13621
13622     6664:
13623     INITD534A:
13624               P0,     BUMP-VERIFY,                              !COUNT
13625               P2-T,   D←CSPD(D17),                              !INITIAL D=(052652)
13626                       D[C]←ALU15,                               !SETUP D[C] FOR SHIFT = "0"
13627               NEXT,   J/COMP534A                                !
     (6664)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..100...0.1.0..0..0...0.0000...0..0000.0...11.000...011.101.111]
13628
13629     6357:  !(FREE)
13630     COMP534A:
13631               SETUP,  D-SWAB,                                   !AMUX/SWAB, BMUX-CMUX/DIRECT
13632               P2-T,   D←D-SHIFTED-XOR-CSPB(B16),                !COMPARE D-SHIFTED:EXPECTED, BITWISE
13633               NEXT,   J/GOBUT534A                               !EXPECTED=(125125)
     (6357)  DCS[0.00.0.0.0.0]  BM[0110..11.01..01.01..000..000...0.1.0..0..0...0.0101...0..0000.0...11.000...011.110.000]
13634
13635     6360:  !(FREE)
13636     GOBUT534A:
13637               SETUP,  RETURN/TEST534B,                          !RETURN TO START OF NEXT SUBTEST
13638               NEXT,   GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
13639                       J/BUTD-IS-ZERO                            !GO TEST D IS ALL ZERO
     (6360)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
13640
13641
13642
13643
13644     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13645
13646     !*** TEST 534B ***
13647     !READ D THRU "D[LO]#D[HI]" PORT OF AMUX[HI,LO], BMUX-CMUX/DIRECT
13648     !IN(D)(125125), OUT(052652)
13649     6634:
13650     TEST534B:
13651               P0,     LOAD-ENUA(ZTARGET402),                    !SETUP FOR D=ZERO TEST
13652                       LOAD-ERROR(TEST534B),                     !ERROR DIRECTORY KEY
13653                       DCS-CTR(CS.),                             !COMPARE AT TARGET
13654                       BUMP-VERIFY,                              !COUNT
13655               NEXT,   J/INITD534B                               !
     (6634)  DCS[1.00.1.0.0.1]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.001]
13656
13657     6361:  !(FREE)
```

```
13658    INITD534B:
13659            P2-T,   D←CSPD(D16),                              !INITIAL D=(125125)
13660                    D[C]←ALU07,                               !SETUP D[C] FOR SHIFT = "0"
13661            NEXT,   J/COMP534B                                !
    (6361)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..011...0.1.0..0..0...0.0001...0..0000.0...11.000...011.110.010]
13662
13663    6362:  !(FREE)
13664    COMP534B:
13665            P0,     BUMP-VERIFY,                              !COUNT
13666            SETUP,  D-SWAB,                                   !AMUX/SWAB, BMUX-CMUX/DIRECT
13667            P2-T,   D←D-SHIFTED-XOR-CSPB(B17),                !COMPARE D-SHIFTED:EXPECTED, BITWISE
13668            NEXT,   J/GOBUT534B                               !EXPECTED=(052652)
    (6362)  DCS[0.00.0.0.0.1]  BM[0110..11.00..01.01..000..000...0.1.0..0..0...0.0101...0..0000.0...11.000...011.110.011]
13669
13670    6363:  !(FREE)
13671    GOBUT534B:
13672            SETUP,  RETURN/SCOPE534B,                         !RETURN TO SCOPE LOOP TEST WORD
13673            NEXT,   GOTO-PAGE(7),                             !BUT TABLE IS ON PAGE 7
13674                    J/BUTD-IS-ZERO                            !GO TEST D IS ALL ZERO
    (6363)  DCS[0.00.0.0.0.0]  BM[0110..00.01..11.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
13675
13676    6364:  !(FREE)
13677    SCOPE534B:
13678            P3,     CSPD[15]←EMIT, EMIT/177400,               !CONSTANT FOR USE BELOW
13679            NEXT,   BUTD[SCOPE],                              !NO ERROR:  "TEST534C" (+1.WORDS)
13680                    J/TEST534C                                !   ERROR:  "INITD534A" (-7.WORDS)
    (6364)  DCS[0.00.0.1.0.0]  BM[1111..10.11..11.00..000..000...0.0.0..0..0...0.0010...1..0000.0...11.000...110.110.101]
13681
13682
13683
13684
13685    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13686
13687    !*** TEST 534C ***
13688    !READ D THRU "8*D[C]*D[HI]" PORT OF AMUX[HI*LO], BMUX-CMUX/DIRECT
13689    !IN(1)(000000), OUT(177400)
13690    6665:
13691    TEST534C:
13692            P0,     LOAD-EMUA(ZTARGET402),                    !SETUP FOR D=ZERO TEST
13693                    LOAD-ERROR(TEST534C),                     !ERROR DIRECTORY KEY
13694                    DCS-CTR(C5.),                             !COMPARE AT TARGET
13695            NEXT,   J/INITD534C                               !
    (6665)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.010]
13696
13697    6662:
13698    INITD534C:
13699            P2-T,   D←ASPHI(C000000),                         !INITIAL D=(000000)
13700                    D[C]←1,                                   !SETUP D[C] FOR SHIFT = "1"
13701            NEXT,   J/COMP534C                                !
    (6662)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..100..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.110.101]
13702
13703    6365:  !(FREE)
13704    COMP534C:
```

```
13705                                                   !CSP(15)=(177400)="1111 1111 0000 0000"
13706           SETUP,  D-RIGHT-8,                      !AMUX/8*D[C]#D<HI>, BMUX-CMUX/DIRECT
13707           P2-T,   D←D-SHIFTED-XOR-CSPB(B15),      !COMPARE D-SHIFTED:EXPECTED, BITWISE
13708           NEXT,   J/GOBUT534C                     !EXPECTED=(177400)
    (6365)  DCS[0.00.0.0.0.0]  BM[0110..11.10..01.01..000..000...0.1.0..0..0...0.0110...0..0000.0...11.000...011.110.110]
13709
13710   6366:  !(FREE)
13711   GOBUT534C:
13712           SETUP,  RETURN/TEST534D,                 !RETURN TO START OF  NEXT SUBTEST
13713           NEXT,   GOTO-PAGE(7),                   !BUT TABLE IS ON PAGE 7
13714                   J/BUTD-IS-ZERO                  !GO TEST  D IS ALL ZERO
    (6366)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
13715
13716
13717
13718
13719   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13720
13721   !*** TEST 534D ***
13722   !READ D THRU "8*D[C]#D[LO]" PORT OF AMUX[HI#LO], BMUX-CMUX/DIRECT
13723   !IN(0)(177777), OUT(000377)
13724   6635:
13725   TEST534D:
13726           PO,     LOAD-EMUA(ZTARGET402),           !SETUP FOR D=ZERO TEST
13727                   LOAD-ERROR(TEST534D),            !ERROR DIRECTORY KEY
13728                   DCS-CTR(CS.),                    !COMPARE AT TARGET
13729           NEXT,   J/INITD534D                      !
    (6635)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.111]
13730
13731   6367:  !(FREE)
13732   INITD534D:
13733           P2-T,   D←BSPHI(C177777),                !INITIAL D=(177777)
13734                   D[C]←0,                          !SETUP D[C] FOR SHIFT = "0"
13735           NEXT,   J/COMP534D                       !
    (6367)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..101..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.111.000]
13736
13737   6370:  !(FREE)
13738   COMP534D:
13739                                                   !CSP(14)=(000377)="0000 0000 1111 1111"
13740           SETUP,  D-SIGNEXT,                       !AMUX/8*D[C]#D<LO>, BMUX-CMUX/DIRECT
13741           P2-T,   D←D-SHIFTED-XOR-CSPB(B14),       !COMPARE D-SHIFTED:EXPECTED, BITWISE
13742           NEXT,   J/GOBUT534D                      !EXPECTED=(000377)
    (6370)  DCS[0.00.0.0.0.0]  BM[0110..11.11..01.01..000..000...0.1.0..0..0...0.0010...0..0000.0...11.000...011.111.001]
13743
13744   6371:  !(FREE)
13745   GOBUT534D:
13746           PO,     BUMP-VERIFY,                     !COUNT
13747           SETUP,  RETURN/SCOPE534D,                !RETURN TO SCOPE LOOP TEST WORD
13748           NEXT,   GOTO-PAGE(7),                    !BUT TABLE IS ON PAGE 7
13749                   J/BUTD-IS-ZERO                   !GO TEST D IS ALL ZERO
    (6371)  DCS[0.00.0.0.0.1]  BM[0110..00.01..11.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
13750
```

```
13751    6372:  !(FREE)
13752    SCOPE534D:
13753            NEXT,   BUTD[SCOPE],                          !NO ERROR:  "TEST534E" (+1.WORDS)
13754                    J/TEST534E                            !   ERROR:  "EXPEC534C" (-9.WORDS)
     (6372)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.011]
13755
13756
13757
13758
13759    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13760
13761    !*** TEST 534E ***
13762    !READ D THRU "COUNTER#D[LO]" PORT OF AMUX[HI#LO], BMUX-CMUX/DIRECT
13763    !IN(0)(000125), OUT(125125), CTR(252)
13764    6663:
13765    TEST534E:
13766            P0,     LOAD-ENUA(ZTARGET402),                 !SETUP FOR D =ZERO TEST
13767                    LOAD-ERROR(TEST534E),                 !ERROR DIRECTORY KEY
13768                    DCS-CTR(C6.),                         !COMPARE AT TARGET
13769            NEXT,   J/LODCNTR534E                         !
     (6663)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.000]
13770
13771    6660:
13772    LODCNTR534E:
13773            P0,     BUMP-VERIFY,                          !COUNT
13774            P2,     COUNTER←BSPHI(C125252),               !PUT A (252) IN BM COUNTER
13775            NEXT,   J/INITD534E                           !(GETS B-BUS[7:0])
     (6660)  DCS[0.00.0.0.0.1]  BM[0000..01.11..00.00..110..000...0.0.0..0..0...0.0000...0..0010.1...11.000...011.111.011]
13776
13777    6373:  !(FREE)
13778    INITD534E:
13779            P0,     BUMP-VERIFY,                          !COUNT
13780            P2-T,   D←CSPD[14]-AND-ASPHI(C052525),         !INITIAL D=(000125), CSP(14)=(000377)
13781                    D[C]←ALU15,                           !SETUP D[C] FOR SHIFT = "0"
13782            NEXT,   J/COMP534E                            !
     (6373)  DCS[0.00.0.0.0.1]  BM[1011..10.00..11.01..111..100...0.1.0..0..0...0.0011...0..0000.0...11.000...011.111.100]
13783
13784    6374:  !(FREE)
13785    COMP534E:
13786            SETUP,  COUNT#D[LO],                          !AMUX/COUNTER#D<LO> BMUX-CMUX/DIRECT
13787            P2-T,   D←D-SHIFTED-XOR-CSPB(B16),            !COMPARE D-SHIFTED:EXPECTED, BITWISE
13788            NEXT,   J/GOBUT534E                           !EXPECTED=(125125)
     (6374)  DCS[0.00.0.0.0.0]  BM[0110..11.01..01.01..000..000...0.1.0..0..0...0.0011...0..0000.0...11.000...011.111.101]
13789
13790    6375:  !(FREE)
13791    GOBUT534E:
13792            SETUP,  RETURN/TEST534F,                      !RETURN TO START OF NEXT SUBTEST
13793            NEXT,   GOTO-PAGE(7),                         !BUT TABLE IS ON PAGE 7
13794                    J/BUTD-IS-ZERO                        !GO TEST D IS ALL ZERO
     (6375)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
13795
13796
13797
```

```
13798
13799    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13800
13801    !*** TEST 534F ***
13802    !READ D THRU "COUNTER#D[HI]" PORT OF AMUX[HI#LO], BMUX-CMUX/DIRECT
13803    !IN(0)(125000), OUT(052652), CTR(125)
13804    6636:
13805    TEST534F:
13806            P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
13807                    LOAD-ERROR(TEST534F),                   !ERROR DIRECTORY KEY
13808                    DCS-CTR(C6.),                           !COMPARE AT TARGET
13809            NEXT,   J/LODCNTR534F                           !
    (6636)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.000]
13810
13811    6400:  !(FREE)
13812    LODCNTR534F:
13813            P2,     COUNTER←BSPHI(C052525),                 !PUT A (125) IN BM COUNTER
13814            NEXT,   J/INITD534F                             !(GETS B-BUS[7-0])
    (6400)  DCS[0.00.0.0.0.0]  BM[0000..01.11..00.00..111..000...0.0.0..0..0...0.0000...0..0010.1...11.000...100.000.001]
13815
13816    6401:  !(FREE)
13817    INITD534F:
13818            P0,     BUMP-VERIFY,                            !COUNT
13819            P2-T,   D←CSPD[15]-AND-ASPHI(C125252),           !INITIAL D=(125000), CSP(15)=(177400)
13820                    D[C]←ALU00,                             !SETUP D[C] FOR SHIFT = "0"
13821            NEXT,   J/COMP534F                              !
    (6401)  DCS[0.00.0.0.0.1]  BM[1011..10.00..11.01..110..010...0.1.0..0..0...0.0010...0..0000.0...11.000...100.000.010]
13822
13823    6402:  !(FREE)
13824    COMP534F:
13825            SETUP,  COUNT#D[HI],                            !AMUX/COUNTER#D<HI>, BMUX-CMUX/DIRECT
13826            P2-T,   D←D-SHIFTED-XOR-CSPB(B17),              !COMPARE D-SHIFTED:EXPECTED, BITWISE
13827            P3,     BUTA(LAST),                             !CLEAR CTR TO (000) DURING P3
13828            NEXT,   J/GOBUT534F                             !EXPECTED=(052652)
    (6402)  DCS[0.00.0.0.0.0]  BM[0110..11.00..01.01..000..000...0.1.0..0..0...0.0111...0..0000.0...10.000...100.000.011]
13829
13830    6403:  !(FREE)
13831    GOBUT534F:
13832            SETUP,  RETURN/TEST534G,                        !RETURN TO START OF NEXT SUBTEST
13833            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
13834                    J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
    (6403)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
13835
13836
13837
13838    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13839
13840    !*** TEST 534G ***
13841    !READ D THRU "COUNTER#D[LO]" PORT OF AMUX[HI#LO], BMUX-CMUX/DIRECT
13842    !COUNTER AND D SHOULD READ ALL ZERO, AFTER BEING ZAPPED IN TEST-534-F
13843    6752:
13844    TEST534G:
13845            P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
```

```
13846                   LOAD-ERROR(TEST534G),                   !ERROR DIRECTORY KEY
13847                   DCS-CTR(C4.),                           !COMPARE AT TARGET
13848           NEXT,   J/COUNTER534G                           !
    (6752)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.100]
13849
13850    6404:  !(FREE)
13851    COUNTER534G:
13852           P2-1,   D←COUNT#D[LO],                          !READ THE MUX INTO D
13853           NEXT,   J/GOBUT534G                             !
    (6404)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.01..000..000...0.1.0..0..0...0.0011...0..0000.0...11.000...100.000.101]
13854
13855    6405:  !(FREE)
13856    GOBUT534G:
13857           P0,     BUMP-VERIFY,                            !COUNT
13858           SETUP,  RETURN/SCOPE534G,                       !RETURN TO SCOPE LOOP TEST WORD
13859           NEXT,   GOTO-PAGE(7),                           !BUT TABLE
13860                   J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
    (6405)  DCS[0.00.0.0.0.1]  BM[0110..00.10..00.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
13861
13862
13863
13864
13865    6406:  !(FREE)
13866    SCOPE534G:
13867           NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST535A" (+1.WORDS)
13868                   J/TEST535A                              !   ERROR:  "LODCNTR534E"(-11.WORDS)
    (6406)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.110.001]
13869
13870
13871
13872
13873    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13874
13875    !*** TEST 535A ***
13876    !READ D THRU "4*D[C]#AMUX<15:04>" PORT OF BMUX, AMUX-CMUX/DIRECT
13877    !IN(1)(122645), OUT(175132)
13878    6661:
13879    TEST535A:
13880           P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
13881                   LOAD-ERROR(TEST535A),                   !ERROR DIRECTORY KEY
13882                   DCS-CTR(C7.),                           !COMPARE AT TARGET
13883                   BUMP-VERIFY,                            !COUNT
13884           NEXT,   J/INIT535A                              !
    (6661)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.110]
13885
13886    6656:
13887    INIT535A:
13888           P3,     CSPD[15]←EMIT,                          !GET INITIAL PATTERN FOR D
13889                   EMIT/122645,                            !"1010 0101 1010 0101"
13890           NEXT,   J/EXPEC535A                             !
    (6656)  DCS[0.00.0.0.0.0]  BM[1010..10.01..01.10..100..101...0.0.0..0..0...0.0010...1..0000.0...11.000...100.000.111]
13891
13892    6407:  !(FREE)
```

```
13893    EXPEC535A:
13894            P3,     CSPD[14]←EMIT,                          !GET EXPECTED PATTERN AFTER SHIFT
13895                    EMIT/175132,                            !"1111 1010 0101 1010"
13896            NEXT,   J/INITD535A                             !
    (6407)  DCS[0.00.0.0.0.0]  BM[1111..10.10..10.01..011..010...0.0.0..0..0...0.0011...1..0000.0...11.000...100.001.000]
13897
13898    6410:  !(FREE)
13899    INITD535A:
13900            P0,     BUMP-VERIFY,                            !COUNT
13901            P2-T,   D←CSPD(D15),                            !INITIAL D=(122645)
13902                    D[C]←ALU15,                             !SETUP D[C] FOR SHIFT = "1"
13903            NEXT,   J/COMP535A                              !
    (6410)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..100...0.1.0..0..0...0.0010...0..0000.0...11.000...100.001.001]
13904
13905    6411:  !(FREE)
13906    COMP535A:
13907            SETUP,  D-RIGHT-4,                              !AMUX/DIRECT, BMUX/RIGHT-4, CMUX/DIRECT
13908            P2-T,   D←D-SHIFTED-XOR-CSPB(B14),              !COMPARE D-SHIFTED:EXPECTED, BITWISE
13909            NEXT,   J/GOBUT535A                             !EXPECTED=(175132)
    (6411)  DCS[0.00.0.0.0.0]  BM[0110..11.11..01.01..000..000...0.1.0..0..0...0.1000...0..0000.0...11.000...100.001.010]
13910
13911    6412:  !(FREE)
13912    GOBUT535A:
13913            SETUP,  RETURN/TEST535B,                        !RETURN TO START OF NEXT SUBTEEST
13914            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
13915                    J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
    (6412)  DCS[0.00.0.0.0.0]  BM[0110..00.11..00.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
13916
13917
13918
13919
13920    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13921
13922    !*** TEST 535B ***
13923    !READ D THRU "4*D[C]*AMUX<15:04>" PORT OF BMUX, AMUX-CMUX/DIRECT
13924    !IN(0)(055132), OUT (002645)
13925    6637:
13926    TEST535B:
13927            P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
13928                    LOAD-ERROR(TEST535B),                   !ERROR DIRECTORY KEY
13929                    DCS-CTR(C6.),                           !COMPARE AT TARGET
13930                    BUMP-VERIFY,                            !COUNT
13931            NEXT,   J/EXPEC535B                             !
    (6637)  DCS[1.00.1.0.0.1]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.011]
13932
13933    6413:  !(FREE)
13934    EXPEC535B:
13935            P3,     CSPD[14]←EMIT,                          !GET EXPECTED PATTERN AFTER SHIFT
13936                    EMIT/002645,                            !"0000 0101 1010 0101"
13937            NEXT,   J/INITD535B                             !
    (6413)  DCS[0.00.0.0.0.0]  BM[0000..10.01..01.10..100..101...0.0.0..0..0...0.0011...1..0000.0...11.000...100.001.100]
13938
13939    6414:  !(FREE)
```

```
13940    INITD535B:
13941            P2-T,   D←NOT-CSPB(B15),                        !INITIAL D=(055132)
13942                    D[C]←ALU15,                             !SETUP D[C] FOR SHIFT = "0"
13943            NEXT,   J/COMP535B                              !
    (6414)  DCS[0.00.0.0.0.0]  BM[0111..11.10..11.01..101..100...0.1.0..0..0...0.0000...0..0000.0...11.000...100.001.101]
13944
13945    6415:  !(FREE)
13946    COMP535B:
13947            SETUP,  D-RIGHT-4,                              !AMUX/DIRECT, BMUX/RIGHT-4, CMUX/DIRECT
13948            P2-T,   D←D-SHIFTED-XOR-CSPB(B14),              !COMPARE D-SHIFTED:EXPECTED, BITWISE
13949            NEXT,   J/GOBUT535B                             !EXPECTED=(002645)
    (6415)  DCS[0.00.0.0.0.0]  BM[0110..11.11..01.01..000..000...0.1.0..0..0...0.1000...0..0000.0...11.000...100.001.110]
13950
13951    6416:  !(FREE)
13952    GOBUT535B:
13953            P0,     BUMP-VERIFY,                            !COUNT
13954            SETUP,  RETURN/SCOPE535B,                       !RETURN TO SCOPE LOOP TEST WORD
13955            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
13956                    J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
    (6416)  DCS[0.00.0.0.0.1]  BM[0110..00.10..00.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
13957
13958    6417:  !(FREE)
13959    SCOPE535B:
13960            P3,     CSPD[16]←EMIT, EMIT/114631,             !CONSTANT FOR USE BELOW
13961            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST536A" (+1.WORDS)
13962                    J/TEST536A                              !    ERROR:  "INIT535A" (-10.WORDS)
    (6417)  DCS[0.00.0.1.0.0]  BM[1001..10.10..01.10..011..001...0.0.0..0..0...0.0001...1..0000.0...11.000...110.101.111]
13963
13964
13965
13966
13967    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
13968
13969    !*** TEST 536A ***
13970    !READ D THRU "2*D[C]*BMUX<15:02>" PORT OF CMUX, AMUX-BMUX/DIRECT
13971    !IN(1)(016161), OUT(143434)
13972    6657:
13973    TEST536A:
13974            P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR DD=ZERO TEST
13975                    LOAD-ERROR(TESP536A),                   !ERROR DIRECTORY KEY
13976                    DCS-CTR(C7.),                           !COMPARE AT TARGET
13977            NEXT,   J/INIT536A                              !
    (6657)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.100]
13978
13979    6654:
13980    INIT536A:
13981            P3,     CSPD[15]←EMIT,                          !GET INITIAL PATTTERN FOR D
13982                    EMIT/016161,                            !"0001 1100 0111 0001"
13983            NEXT,   J/EXPEC536A                             !
    (6654)  DCS[0.00.0.0.0.0]  BM[0001..10.11..00.01..110..001...0.0.0..0..0...0.0010...1..0000.0...11.000...100.010.000]
13984
13985    6420:  !(FREE)
13986    EXPEC536A:
```

```
13987            P0,     BUMP-VERIFY,                                !COUNT
13988            P3,     CSPD[14]←EMIT,                              !GET EXPECTED PATTERN AFTER SHIFT
13989                    EMIT/143434,                                !"1100 0111 0001 1100"
13990            NEXT,   J/INITD536A                                 !
    (6420)  DCS[0.00.0.0.0.1]  BM[1100..10.01..11.00..011..100...0.0.0..0..0...0.0011...1..0000.0...11.000...100.010.001]
13991
13992    6421:  !(FREE)
13993    INITD536A:
13994            P2-T,   D←CSPD(D15),                                !INITIAL D=(016161)
13995                    D[C]←ALU00,                                 !SETUP D[C] FOR SHIFT = "1"
13996            NEXT,   J/COMP536A                                  !
    (6421)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..C00..010...0.1.0..0..0...0.0010...0..0000.0...11.000...100.010.010]
13997
13998    6422:  !(FREE)
13999    COMP536A:
14000            SETUP,  D-RIGHT-2,                                  !AMUX-BMUX/DIRECT, CMUX/RIGHT-2
14001            P2-T,   D←D-SHIFTED-XOR-CSPB(B14),                  !COMPARE D-SHIFTED:EXPECTED, BITWISE
14002            NEXT,   J/GOBUT536A                                 !EXPECTED =(143434)
    (6422)  DCS[0.00.0.0.0.0]  BM[0110..11.11..01.11..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.010.011]
14003
14004    6423:  !(FREE)
14005    GOBUT536A:
14006            SETUP,  RETURN/TEST536B,                            !RETURN TO START OF NEXT SUBTEST
14007            NEXT,   GOTO-PAGE(7),                               !BUT TABLE IS ON PAGE 7
14008                    J/BUTD-IS-ZERO                              !GO TEST D IS ALL ZERO
    (6423)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
14009
14010
14011
14012
14013    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14014
14015    !*** TEST 536B ***
14016    !READ D THRU "2*D[C]#BMUX<15:02>" PORT OF CMUX, AMUX-BMUX/DIRECT
14017    !IN(0)(161616), OUT(034343)
14018    6640:
14019    TEST536B:
14020            P0,     LOAD-ENUA(ZTARGET402),                      !SETUP FOR D=ZERO TEST
14021                    LOAD-ERROR(TEST536B),                       !ERROR DIRECTORY KEY
14022                    DCS-CTR(C6.),                               !COMPARE AT TARGET
14023            NEXT,   J/EXPEC536B                                 !
    (6640)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.100]
14024
14025    6424:  !(FREE)
14026    EXPEC536B:
14027            P0,     BUMP-VERIFY,                                !COUNT
14028            P3,     CSPD[14]←EMIT,                              !GET EXPECTED PATTERN AFTER SHIFT
14029                    EMIT/034343,                                !"1110 0011 1000 1110"
14030            NEXT,   J/INITD536B                                 !
    (6424)  DCS[0.00.0.0.0.1]  BM[0011..10.10..00.11..100..011...0.0.0..0..0...0.0011...1..0000.0...11.000...100.010.101]
14031
14032    6425:  !(FREE)
14033    INITD536B:
```

```
14034            P2-T,   D←NOT-CSPB(B15),                        !INITIAL D=(161616)
14035                    D[C]←ALU00,                             !SETUP D[C] FOR SHIFT = "0"
14036            NEXT,   J/COMP536B                              !
     (6425)  DCS[0.00.0.0.0.0]  BM[0111..11.10..11.01..101..010...0.1.0..0..0...0.0000...0..0000.0...11.000...100.010.110]
14037
14038    6426:  !(FREE)
14039    COMP536B:
14040            PO,     BUMP-VERIFY,                            !COUNT
14041            SETUP,  D-RIGHT-2,                              !AMUX-BMUX/DIRECT, CMUX/RIGHT-2
14042            P2-T,   D←D-SHIFTED-XOR-CSPB(B14),              !COMPARE D-SHIFTED:EXPECTED, BITWISE
14043            NEXT,   J/GOBUT536B                             !EXPECTED=(034343)
     (6426)  DCS[0.00.0.0.0.1]  BM[0110..11.11..01.11..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.010.111]
14044
14045    6427:  !(FREE)
14046    GOBUT536B:
14047            SETUP,  RETURN/SCOPE536B,                       !RETURN TO SCOPE LOOP TEST WORD
14048            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
14049                    J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
     (6427)  DCS[0.00.0.0.0.0]  BM[0110..00.10..00.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
14050
14051    6430:  !(FREE)
14052    SCOPE536B:
14053            PO,     BUMP-VERIFY,                            !COUNT
14054            P3,     CSPD[17]←EMIT, EMIT/031463,             !CONSTANT FOR USE BELOW
14055            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST536C" (+1.WORDS)
14056                    J/TEST536C                              !   ERROR:  "INIT536A"(-10.WORDS)
     (6430)  DCS[0.00.0.1.0.1]  BM[0011..10.00..11.00..110..011...0.0.0..0..0...0.0000...1..0000.0...11.000...110.101.101]
14057
14058
14059
14060
14061    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14062
14063    !*** TEST 536C ***
14064    !READ D THRU "D[C]←BMUX<15:01>" PORT OF CMUX, AMUX-BMUX/DIRECT
14065    !IN(1)(031463), OUT(114631)
14066    6655:
14067    TEST536C:
14068            PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
14069                    LOAD-ERROR(TEST536C),                   !ERROR DIRECTORY KEY
14070                    DCS-CTR(C5.),                           !COMPARE AT TARGET
14071                    BUMP-VERIFY,                            !COUNT
14072            NEXT,   J/INITD536C                             !
     (6655)  DCS[1.00.1.0.0.1]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.010]
14073
14074    6652:
14075    INITD536C:
14076            PO,     BUMP-VERIFY,                            !COUNT
14077            P2-T,   D←CSPD(D17),                            !INITIAL D=(031463)
14078                    D[C]←ALU00,                             !SETUP D[C] FOR SHIFT = "1"
14079            NEXT,   J/COMP536C                              !"0011 0011 0011 0011"
     (6652)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..010...0.1.0..0..0...0.0000...0..0000.0...11.000...100.011.001]
14080
```

```
14081     6431:  !(FREE)
14082     COMP536C:
14083            SETUP,  D-RIGHT-1,                          !AMUX-BMUX/DIRECT, CMUX/RIGHT-1
14084            P2-T,   D←D-SHIFTED-XOR-CSPB(B16),          !COMPARE D-SHIFTED:EXPECTED, BITWISE
14085            NEXT,   J/GOBUT536C                         !EXPECTED=(114631)
     (6431)  DCS[0.00.0.0.0.0]  BM[0110..11.01..01.10..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.011.010]
14086                                                        !"1001 1001 1001 1001"
14087
14088     6432:  !(FREE)
14089     GOBUT536C:
14090            SETUP,  RETURN/TEST536D,                     !RETURN TO START OF NEXT SUBTEST
14091            NEXT,   GOTO-PAGE(7),                       !BUT TABLE IS ON PAGE 7
14092                    J/BUTD-IS-ZERO                      !GO TEST D IS ALL ZERO
     (6432)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
14093
14094
14095
14096
14097     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14098
14099     !*** TEST 536D ***
14100     !READ D THRU "D[C]←BML..<15:01>" PORT OF CMUX, AMUX-BMUX/DIRECT
14101     !IN(0)(146314), OUT(063146)
14102     6641:
14103     TEST536D:
14104            P0,     LOAD-EMUA(ZTARGET402),               !SETUP FOR D=ZERO TEST
14105                    LOAD-ERROR(TEST536D),               !ERROR DIRECTORY KEY
14106                    DCS-CTR(C7.),                       !COMPARE AT TARGET
14107            NEXT,   J/INIT536D                          !
     (6641)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.011]
14108
14109     6433:  !(FREE)
14110     INIT536D:
14111            P3,     CSPD[15]←EMIT,                      !GET INITIAL PATTERN FOR D
14112                    EMIT/146314,                        !"1100 1100 1100 1100"
14113            NEXT,   J/EXPEC536D                         !
     (6433)  DCS[0.00.0.0.0.0]  BM[1100..10.11..00.11..001..100...0.0.0..0..0...0.0010...1..0000.0...11.000...100.011.100]
14114
14115     6434:  !(FREE)
14116     EXPEC536D:
14117            P3,     CSPD[14]←EMIT,                      !GET EXPECTED PATTERN AFTER SHIFT
14118                    EMIT/063146,                        !"0110 0110 0110 0110"
14119            NEXT,   J/INITD536D                         !
     (6434)  DCS[0.00.0.0.0.0]  BM[0110..10.01..10.01..100..110...0.0.0..0..0...0.0011...1..0000.0...11.000...100.011.101]
14120
14121     6435:  !(FREE)
14122     INITD536D:
14123            P0,     BUMP-VERIFY,                        !COUNT
14124            P2-T,   D←CSPD(D15),                        !INITIAL D=(146314)
14125                    D[C]←0,                             !SETUP D[C] FOR SHIFT = "0"
14126            NEXT,   J/COMP536D                          !
     (6435)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0010...0..0000.0...11.000...100.011.110]
14127
```

```
14128    6436:  !(FREE)
14129    COMP536D:
14130            SETUP,  D-RIGHT-1,                          !AMUX-BMUX/DIRECT, CMUX/RIGHT-1
14131            P2-T,   D←D-SHIFTED-XOR-CSPB(B14),          !COMPARE D-SHIFTED:EXPECTED, BITWISE
14132            NEXT,   J/GOBUT536D                         !EXPECTED=(063146)
      (6436)  DCS[0.00.0.0.0.0]  BM[0110..11.11..01.10..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.011.111]
14133
14134    6437:  !(FREE)
14135    GOBUT536D:
14136            SETUP,  RETURN/SCOPE536D,                   !RETURN TO SCOPE LOOP TEST WORD
14137            NEXT,   GOTO-PAGE(7),                       !BUT TABLE IS ON PAGE 7
14138                    J/BUTD-IS-ZERO                      !GO TEST D IS ALL ZERO
      (6437)  DCS[0.00.0.0.0.0]  BM[0110..00.10..01.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
14139
14140    6440:  !(FREE)
14141    SCOPE536D:
14142            NEXT,   BUTD[SCOPE],                        !NO ERROR:  "TEST536E" (+1.WORDS)
14143                    J/TEST536E                          !   ERROR:  "INIT536C" (-11.WORDS)
      (6440)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.101.011]
14144
14145
14146
14147
14148    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
14149
14150    !*** TEST 536E ***
14151    !READ D THRU BMUX<14:00>⇐SENDMUX(=SR15) PORT OF CMUX, AMUX-BMUX/DIRECT
14152    !IN(D)(146314), OUT(114631), SR=(100000)
14153    6653:
14154    TEST536E:
14155            PD,     LOAD-EMUA(ZTARGET402),              !SETUP FOR D=ZERO TEST
14156                    LOAD-ERROR(TEST536E),               !ERROR DIRECTORY KEY
14157                    DCS-CTR(C6.),                       !COMPARE AT TARGET
14158            P3,     BUTA(CLR-FLAG-RES-UCON),            !SELECT SR-LOAD, SENDMUX PORTS 0123, BUSDIN←EMIT
14159            NEXT,   J/LOADSR536E                        !
      (6653)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.010...110.101.000]
14160
14161    6650:
14162    LOADSR536E:
14163            PD,     BUMP-VERIFY,                        !COUNT
14164            P2-T,   SR←BSPHI(C100000),                  !(100000) IN SR<15:00>
14165            NEXT,   J/INITD536E                         !
      (6650)  DCS[0.00.0.0.0.1]  BM[1010..01.11..00.00..001..000...0.0.1..0  0...0.0000...0..0000.0...11.000...100.100.001]
14166
14167    6441:  !(FREE)
14168    INITD536E:
14169            PD,     BUMP-VERIFY,                        !COUNT
14170            P2-T,   D←CSPD(D15),                        !INITIAL D=(146314)
14171                    D[C]←0,                             !SETUP D[C] FOR SHIFT = "0"
14172            NEXT,   J/COMP536E                          !
      (6441)  DCS[0.00.0.0.0.1]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0010...0..0000.0...11.000...100.100.010]
14173
14174    6442:  !(FREE)
```

```
14175    COMP536E:
14176            SETUP,  D-LEFT-1,                                !AMUX-BMUX/DIRECT, CMUX/LEFT-1
14177                                                             !BIT<00> = SR<15> = SENDMUX PORT 0 = (1)
14178            P2-T,   D←D-SHIFTED-XOR-CSPB(B16),               !COMPARE D-SHIFTED:EXPECTED, BITWISE
14179            NEXT,   J/GOBUT536E                              !EXPECTED=(114631)
     (6442)  DCS[0.00.0.0.0.0]  BM[0110..11.01..01.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.100.011]
14180
14181    6443:  !(FREE)
14182    GOBUT536E:
14183            SETUP,  RETURN/TEST536F,                         !RETURN TO START OF NEXT SUBTEST
14184            NEXT,   GOTO-PAGE(7),                            !BUT TABLE IS ON PAGE 7
14185                    J/BUTD-IS-ZERO                           !GO TEST D IS ALL ZERO
     (6443)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
14186
14187
14188
14189
14190    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14191
14192    !*** TEST 536F ***
14193    !READ D THRU BMUX<14:00>#SENDMUX(=SR15) PORT OF CMUX, AMUX-BMUX/DIRECT
14194    !IN(0)(031463), (063146), SR=(077777)
14195    6642:
14196    TEST536F:
14197            P0,     LOAD-ENUA(ZTARGET402),                   !SETUP FOR D=ZERO TEST
14198                    LOAD-ERROR(TEST536F),                    !ERROR DIRECTORY KEY
14199                    DCS-CTR(C6.),                            !COMPARE AT TARGET
14200            NEXT,   J/LOADSR536F                             !
     (6642)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.100.100]
14201
14202    6444:  !(FREE)
14203    LOADSR536F:
14204            P0,     BUMP-VERIFY,                             !COUNT
14205            P2-T,   SR←NOT-ASPHI(C100000),                   !(077777) IN SR <15:00>
14206            NEXT,   J/INITD536F                              !
     (6444)  DCS[0.00.0.0.0.1]  BM[0000..00.00..11.01..001..000...0.0.1..0..0...0.0000...0..0000.0...11.000...100.100.101]
14207
14208    6445:  !(FREE)
14209    INITD536F:
14210            P2-T,   D←CSPD(D17),                             !INITIAL D=(031463)
14211                    D[C]←0,                                  !SETUP D[C] FOR SHIFT = "0"
14212            NEXT,   J/COMP536F                               !
     (6445)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.100.110]
14213
14214    6446:  !(FREE)
14215    COMP536F:
14216            SETUP,  D-LEFT-1,                                !AMUX-BMUX/DIRECT, CMUX/LEFT-1
14217                                                             !BIT<00> = SR<15> = SENDMUX PORT 0 = (0)
14218            P2-T,   D←D-SHIFTED-XOR-CSPB(B14),               !COMPARE D-SHIFTED:EXPECTED, BITWISE
14219            NEXT,   J/GOBUT536F                              !EXPECTED =(063146)
     (6446)  DCS[0.00.0.0.0.0]  BM[0110..11.11..01.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...100.100.111]
14220
14221    6447:  !(FREE)
```

```
14222    GOBUT536F:
14223            SETUP,  RETURN/SCOPE536F,                       !RETURN TO SCOPE LOOP TEST WORD
14224            NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
14225                    J/BUTD-IS-ZERO                          !GO TEST D IS ALL ZERO
     (6447)  DCS[0.00.0.0.0.0]  BM[0110..00.10..01.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
14226
14227    6450:  !(FREE)
14228    SCOPE536F:
14229            PD,     BUMP-VERIFY,                            !COUNT
14230            P3,     CSPD[02]←EMIT,                          !RES-CON #1:   (FOR USE BELOW)
14231            EMITC,  SENDMUX-0123-SEL,                       !  SELECT SENDMUX PORTS 0-3
14232                    SR-LEFT, GUARD-DIS,                     !  SR GOES LEFT, SR<00>←D[C]
14233            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "SETEMIT537A" (+1.WORDS)
14234                    J/SETEMIT537A                           !   ERROR:  "LOADSR536E" (-9.WORDS)
     (6450)  DCS[0.00.0.1.0.1]  BM[0101..10.00..00.00..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...110.101.001]
14235
14236
14237
14238
14239    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14240
14241    !*** TEST 537A ***
14242    !THIS TEST VALIDATES THE "SENDMUX" INPUTS TO THE SHIFT-TREE.
14243    !EACH 'SENDMUX' OUTPUT IS SET TO 1/0 VALUES, AND THEN READ OUT INTO THE 'SR' WHERE THEY
14244    !ARE ALL SAVED TO CHECK AT ONCE.
14245    6651:
14246    SETEMIT537A:
14247            PD,     DCS-CTR(C15.),                          !HOLD UP FOR NOW
14248            NEXT,   GOTO-PAGE(4),                           !XFER
14249                    J/LOAD16537A                            !
     (6651)  DCS[0.00.1.0.0.0]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.100...101.111.100]
14250
14251    4574:
14252    LOAD16537A:
14253            P3,     CSPD[16]←EMIT,                          !BIT03 ONLY SET
14254                    EMIT/000010,                            !
14255                    BUTA(CLR-FLAG-RES-UCON),                !BUSDIN <- EMIT, SR LOAD
14256            NEXT,   J/LOAD14537A                            !
     (4574)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..001..000...0.0.0..0..0...0.0001...1..0000.0...11.010...010.111.110]
14257
14258    4276:  !(FREE)
14259    LOAD14537A:
14260
14261            P3,     CSPD[14]←EMIT,                          !BIT11 ONLY SET
14262                    EMIT/004000,                            !
14263            NEXT,   J/LOAD03537A                            !
     (4276)  DCS[0.00.0.0.0.0]  BM[0000..10.10..00.00..000..000...0.0.0..0..0...0.0011...1..0000.0...11.000...010.111.111]
14264
14265    4277:  !(FREE)
14266    LOAD03537A:
14267            P3,     CSPD[03]←EMIT,                          !WHAT THE 'SR' SHOULD BE
14268                    EMIT/177252,                            !AFTER THIS TEST
```

```
14269                NEXT,    J/LOAD01537A                                  !
     (4277)  DCS[0.00.0.0.0.0]  BM[1111..10.11..10.10..101..010...0.0.0..0..0...0.1100...1..0000.0...11.000...011.000.000]
14270
14271     4300:  !(FREE)
14272     LOAD01537A:
14273                P3,      CSPD[01]←EMIT,                                !RES-CON #2:
14274                EMITC,   SENDMUX-4567-SEL,                             !  SELECT SENDMUX PORTS 4-7
14275                         SR-LEFT, GUARD-DIS,                           !  SR GOES LEFT, SR<00>←D[C]
14276                NEXT,    GOTO-PAGE(7),                                 !XFER
14277                         J/INITSR537A                                  !
     (4300)  DCS[0.00.0.0.0.0]  BM[0001..10.00..00.00..000..111...0.0.0..0..0...0.1110...1..0000.0...11.100...001.011.001]
14278
14279     7131:  !(FREE)
14280     INITSR537A:
14281                P2-T,    SR←ALL-ONES,                                  !START 'SR' WITH ALL ONES
14282                NEXT,    J/SETRESA537A                                 !
     (7131)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..101..000...0.0.1..0..0...0.0000...0..0000.0...11.000...001.011.101]
14283
14284     7135:  !(FREE)
14285     SETRESA537A:
14286                P2,      RES←CSPD(002),                                !LOAD RES W/ RES-CON#1 (SENDMUX-0123)
14287                NEXT,    GOTO-PAGE(6),                                 !XFER
14288                         J/NEWCTR537A                                  !
     (7135)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..110...0.0.0..0..0...0.1101...0..1000.1...11.100...110.100.011]
14289
14290     6643:
14291     NEWCTR537A:
14292                P0,      LOAD-ENUA(SETRESB537A),                       !COMPARE POINT #2
14293                         LOAD-ERROR(NEWCTR537A),                       !ERROR DIRECTORY KEY
14294                         DCS-CTR(C14.),                                !COMPARE BELOW
14295                NEXT,    J/AR3-537A                                    !
     (6643)  DCS[1.00.1.0.0.0]  BM[0001..00.11..10.11..111..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.101.001]
14296
14297     6451:  !(FREE)
14298     AR3-537A:
14299                P0,      BUMP-VERIFY,                                  !COUNT
14300                P2-T,    D←NOT-CSPD(016),                              !D=(177767), BIT03="0"
14301                NEXT,    GOTO-PAGE(7),                                 !XFER
14302                         J/BR3-537A                                    !
     (6451)  DCS[0.00.0.0.0.1]  BM[0111..10.00..11.01..101..111...0.1.0..0..0...0.0001...0..0000.0...11.100...001.011.100]
14303
14304     7134:  !(FREE)
14305     BR3-537A:
14306                P2-T,    D←D-RIGHT-3,                                  !USE SENDMUX PORT 1 = AMUX03 = "0"
14307                         D[C]←ALU00,                                   !INTO D[C] FOR SR
14308                NEXT,    J/CR3-537A                                    !
     (7134)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1000...0..0000.0...11.000...001.011.111]
14309
14310     7137:  !(FREE)
14311     CR3-537A:
14312                P2-T,    SR←SR-LEFT-1,                                 !SENDMUX OUTPUT INTO SR<00>
```

```
14313                   D←CSPB(B16), SAVE-D[C],                 !D=(000010), BIT03="1"
14314           NEXT,   J/DR3-537A                              !
    (7137)  DCS[0.00.0.0.0.0]  BM[1010..11.01..00.00..000..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.100.000]
14315
14316   7140:  !(FREE)
14317   DR3-537A:
14318           P2-T,   D←D-RIGHT-3,                            !USE SENDMUX PORT 1 = AMUX03 = "1"
14319                   D[C]←ALU00,                             !INTO D[C] FOR SR
14320           NEXT,   J/AR7-537A                              !
    (7140)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1000...0..0000.0...11.000...001.100.001]
14321
14322   7141:  !(FREE)
14323   AR7-537A:
14324           P2-T,   SR←SR-LEFT-1,                           !SENDMUX OUTPUT INTO SR<00>
14325                   D←NOT-ASPHI(C000200), SAVE-D[C],        !D=(177577), BIT07="0"
14326           NEXT,   J/BR7-537A                              !
    (7141)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..010..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.100.010]
14327
14328   7142:  !(FREE)
14329   BR7-537A:
14330           P2-T,   D←D-RIGHT-7,                            !USE SENDMUX PORT 2 = D07 = "0"
14331                   D[C]←ALU00,                             !INTO D[C] FOR SR
14332           NEXT,   J/CR7-537A                              !
    (7142)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.0110...0..0000.0...11.000...001.100.011]
14333
14334   7143:  !(FREE)
14335   CR7-537A:
14336           P2-T,   SR←SR-LEFT-1,                           !SENDMUX OUTPUT INTO SR<00>
14337                   D←ASPHI(C000200), SAVE-D[C],            !D=(000200), BIT07="1"
14338           NEXT,   J/DR7-537A                              !
    (7143)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..010..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.100.100]
14339
14340   7144:  !(FREE)
14341   DR7-537A:
14342           P2-T,   D←D-RIGHT-7,                            !USE SENDMUX PORT 2 = D07 = "1"
14343                   D[C]←ALU00,                             !INTO D[C] FOR SR
14344           NEXT,   J/AR11-537A                             !
    (7144)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.0110...0..0000.0...11.000...001.100.101]
14345
14346   7145:  !(FREE)
14347   AR11-537A:
14348           P2-T,   SR←SR-LEFT-1,                           !SENDMUX OUTPUT INTO SR<00>
14349                   D←NOT-CSPB(B14), SAVE-D[C],             !D=(173777), BIT11="0"
14350           NEXT,   J/BR11-537A                             !
    (7145)  DCS[0.00.0.0.0.0]  BM[0111..11.11..11.01..101..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.100.110]
14351
14352   7146:  !(FREE)
14353   BR11-537A:
14354           P2-T,   D←D-RIGHT-11,                           !USE SENDMUX PORT 3 = AMUX03 = "0"
14355                   D[C]←ALU00,                             !INTO D[C] FOR SR
14356           NEXT,   J/CR11-537A                             !
    (7146)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1110...0..0000.0...11.000...001.100.111]
14357
14358   7147:  !(FREE)
```

```
14359    CR11-537A:
14360            P2-T,    SR←SR-LEFT-1,                          !SENDMUX OUTPUT INTO SR<00>
14361                     D←CSPB(B14), SAVE-D[C],                !D=(004000), BIT11="1"
14362            NEXT,    J/DR11-537A                            !
     (7147)  DCS[0.00.0.0.0.0]  BM[1010..11.11..00.00..000..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.101.000]
14363
14364    7150:  !(FREE)
14365    DR11-537A:
14366            P2-T,    D←D-RIGHT-11,                          !USE SENDMUX PORT 3 = AMUX03 = "1"
14367                     D[C]←ALU00,                            !INTO D[C] FOR SR
14368            NEXT,    J/ER3-537A                             !
     (7150)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1110...0..0000.0...11.000...001.101.001]
14369
14370    7151:  !(FREE)
14371    ER3-537A:
14372            P2-T,    SR←SR-LEFT-1,                          !SENDMUX OUTPUT INTO SR<00>
14373                     D←NOT-CSPB(B16), SAVE-D[C],            !D=(177767), BIT03="0"
14374            NEXT,    J/SETRESB537A                          !
     (7151)  DCS[0.00.0.0.0.0]  BM[0111..11.01..11.01..101..111...0.1.1..0..0...0.0000...0..0000.0...11.000...011.111.000]
14375
14376    7370:
14377    SETRESB537A:
14378            P2,      RES←CSPD(D01),                         !LOAD RES W/RES-CON#2 (SENDMUX-4567)
14379            NEXT,    J/FR3-537A                             !
     (7370)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1110...0..1000.1...11.000...001.101.010]
14380
14381    7152:  !(FREE)
14382    FR3-537A:
14383            P2-T,    D←D-RIGHT-3,                           !USE SENDMUX PORT 5 = AMUX03 = "0"
14384                     D[C]←ALU00,                            !INTO D[C] FOR SR
14385            NEXT,    J/GR3-537A                             !
     (7152)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1000...0..0000.0...11.000...001.101.011]
14386
14387    7153:  !(FREE)
14388    GR3-537A:
14389            P2-T,    SR←SR-LEFT-1,                          !SENDMUX OUTPUT INTO SR<00>
14390                     D←CSPB(B16), SAVE-D[C],                !D=(000010), BIT03="1"
14391            NEXT,    J/HR3-537A                             !
     (7153)  DCS[0.00.0.0.0.0]  BM[1010..11.01..00.00..000..111...0.1.1..0..0...0.0000...0..0000.0...11.000...001.101.100]
14392
14393    7154:  !(FREE)
14394    HR3-537A:
14395            P2-T,    D←D-RIGHT-3,                           !USE SENDMUX PORT 5 = AMUX03 = "1"
14396                     D[C]←ALU00,                            !INTO D[C] FOR SR
14397            NEXT,    J/AL1-537A                             !
     (7154)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.1000...0..0000.0...11.000...001.101.101]
14398
14399    7155:  !(FREE)
14400    AL1-537A:
14401            P2-T,    SR←SR-LEFT-1,                          !SENDMUX OUTPUT INTO SR<00>
14402                     D←ALL-ONES,                            !D=(177777)
14403            NEXT,    GOTO-PAGE(4),                          !XFER
14404                     J/BL1-537A                             !
```

```
      (7155)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..101..100...0.1.1..0..0...0.0000...0..0000.0...11.100...010.100.010]
14405
14406     4242:  !(FREE)
14407     BL1-537A:
14408           P2-T,   D←D-LEFT-1,                          !USE SENDMUX PORT 4 = HARD "0"
14409                   D[C]←ALU00,                          !INTO D[C] FOR SR
14410           NEXT,   J/TEST537A                           !
      (4242)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.00..000..010...0.1.0..0..0...0.0000...0..0000.0...11.000...101.111.010]
14411
14412     4572:
14413     TEST537A:
14414           P0,     LOAD-ENUA(ZTARGET402),               !SETUP FOR D-IS-ZERO COMPARE
14415                   LOAD-ERROR(TEST537A),                !ERROR DIRECTORY KEY
14416                   DCS-CTR(C4.),                        !COMPARE AT TARGET
14417                   BUMP-VERIFY,                         !COUNT
14418           P2-T,   SR←SR-LEFT-1,                        !SENDMUX OUTPUT INTO SR<00>
14419           NEXT,   J/COMP537A                           !
      (4572)  DCS[1.00.1.0.0.1]  BM[1011..00.11..11.00..000..010...0.0.1..0..0...0.0000...0..0000.0...11.000...011.000.010]
14420
14421     4302:  !(FREE)
14422     COMP537A:
14423           P2-T,   D←SR-XOR-CSPD(D03),                  !COMPARE RECEIVED:EXPECTED BITWISE
14424           P3,     BUTA(CLR-FLAG-RES-UCON),             !RESET SR TO LOAD/GUARD-DIS
14425           NEXT,   J/GOBUT537A                          !
      (4302)  DCS[0.00.0.0.0.0]  BM[0110..10.00..00.00..000..000...0.1.0..0..0...0.1100...0..0000.0...11.010...011.000.011]
14426
14427     4303:  !(FREE)
14428     GOBUT537A:
14429           SETUP,  RETURN/SCOPE537A,                    !RETURN TO SCOPE LOOP TEST WORD
14430           NEXT,   GOTO-PAGE(7),                        !BUT TABLE IS ON PAGE 7
14431                   J/BUTD-IS-ZERO                       !GO TEST D IS ALL ZERO
      (4303)  DCS[0.00.0.0.0.0]  BM[0100..00.01..10.00..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
14432
14433     4304:  !(FREE)
14434     SCOPE537A:
14435           P0,     BUMP-VERIFY,                         !COUNT
14436                   BUSDIN←EMIT-[I],                     !RESET PROC UCON
14437                   EN-CLK-IR[15-00],                    !
14438           NEXT,   BUTD[SCOPE],                         !NO ERROR:  "TEST551A" (+1.WORD)
14439                   J/TEST551A                           !   ERROR:  "LOAD16537A" (-30.WORDS)
      (4304)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.111.101]
14440
14441
14442
14443
14444
14445     !.PAGE=============================================================================================================
14446
14447
14448     .TOC   *   TEST551:  BASE MACHINE DATAPATH COUNTER CAN COUNT
14449
14450
14451     !*****************************************************************************************
```

```
14452     !*
14453     !*     TESTS:  551 A - C                                    UWORDS:  015 + 035
14454     !*
14455     !*     FUNCTIONS:
14456     !*
14457     !*     THE FOLLOWING THREE TESTS USE A COMMON SUBROUTINE TO TEST THE COUNTING
14458     !*     ABILITY OF THE BASE MACHINE DATAPATH COUNTER;  USING THE THREE ACTIVE
14459     !*     BUTS THAT ENABLE COUNTING.  ADMITTEDLY THIS SEEMS LIKE OVERKILL, BUT
14460     !*     THIS METHOD WAS  THE LEAST EXPENSIVE IN  TERMS OF NUMBER OF MICROWORDS
14461     !*     USED FOR THE TESTING.
14462     !*
14463     !*****************************************************************************************
14464
14465
14466
14467     !THE FIRST TEST USES THE ACTIVE BUT(#13) "SR<1:0>#COUNT-IS-377" TO CHECK THE COUNTER
14468     4575:
14469     TEST551A:
14470             PO,     LOAD-ERROR(TEST551A),                        !ERROR DIRECTORY KEY
14471                     DCS-CTR(C15.),                               !HOLD UP FOR NOW
14472                     BUMP-VERIFY,                                 !BUMP DCS COUNTER
14473             NEXT,   J/LOADIN551A                                 !
    (4575)  DCS[1.00.1.0.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.000.101]
14474
14475     4305:  !(FREE)
14476     LOADIN551A:
14477             P3,     CSPD[17]←EMIT, EMIT/400,                     !INCREMENT FOR D, TO MATCH COUNTER
14478             NEXT,   J/SETSR551A                                  !
    (4305)  DCS[0.00.0.0.0.0]  BM[0000..10.00..01.00..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...011.000.110]
14479
14480     4306:  !(FREE)
14481     SETSR551A:
14482             PO,     BUMP-VERIFY,                                 !COUNT
14483             P2-T,   SR←ZERO,                                     !KEY IN SR<1:0>=(00) FOR SELECT THIS BUT
14484             NEXT,   J/GOTEST551A                                 !
    (4306)  DCS[0.00.0.0.0.1]  BM[0011..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...101.110.100]
14485
14486     4564:
14487     GOTEST551A:
14488             SETUP,  RETURN/TEST551B,                             !GO TO TEST SUBROUTINE
14489             NEXT,   CALL[COUNT-TEST]                             !  (SEE DESCRIP, FOLLOWING)
    (4564)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.11..110..100...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
14490
14491
14492
14493
14494     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
14495
14496     !THE SECOND TEST USES THE ACTIVE BUT(#25) "COUNT-IS-377" TO CHECK THE COUNTER
14497     4576:
14498     TEST551B:
14499             PO,     LOAD-EMUA(ZTARGET400),                       !BIT<1:0> CLEAR
14500                     LOAD-ERROR(TEST551B),                        !ERROR DIRECTORY KEY
14501                     DCS-CTR(C4.),                                !COMPARE AT TARGET
```

```
14502            NEXT,   BUTD[SCOPE],                          !NO ERROR:  "SETSR551B" (+1. WORDS)
14503                    J/SETSR551B                           !   ERROR:  "GOTEST551A" (-1. WORDS) REPEAT PREV TEST
     (4576)  DCS[1.00.1.1.0.0]  BM[1011..00.11..11.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.101]
14504
14505    4565:
14506    SETSR551B:
14507            P2-T,   SR←SR-PLUS-1,                         !KEY IN SR<1:0>=(01) FOR SELECT THIS BUT
14508            NEXT,   J/GOTEST551B                          !
     (4565)  DCS[0.00.0.0.0.0]  BM[1001..01.11..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.000...101.110.000]
14509
14510    4560:
14511    GOTEST551B:
14512            SETUP,  RETURN/GOTEST551B1,                   !RETURN TO START OF NEXT SUBTEST
14513            NEXT,   GOTO-PAGE(7),                         !BUT TABLE
14514                    J/BUTCOUNT-IS-377                     !FAKE A TEST
     (4560)  DCS[0.00.0.0.0.0]  BM[0111..00.00..11.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.011.110]
14515
14516    7136:  !(FREE)
14517    BUTCOUNT-IS-377:
14518            NEXT,   BUT(COUNT-IS-377),                    !SHOULD TARGET INTO *** *** *00
14519                    J/ZTARGET400                          !BIT<1:0> BOTH CLEAR
     (7136)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.101...100.000.000]
14520
14521
14522    !      -       -       -       -       -       -       -       -       -       -       -       -
14523
14524
14525    !   AND NOW TEST THAT THE ACTUAL BUT/COUNTER WORKS
14526
14527    7157:  !(FREE)
14528    GOTEST551B1:
14529            SETUP,  RETURN/TEST551C,                      !GO TO TEST SUBROUTINE
14530            NEXT,   CALL[COUNT-TEST]                      !  (SEE DESCRIP, FOLLOWING)
     (7157)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.10..110..100...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
14531
14532
14533
14534
14535    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14536
14537    !THE THIRD TEST USES THE ACTIVE BUT(#17) "COUNT-IS-377#D[C]" TO CHECK THE COUNTER
14538    4566:
14539    TEST551C:
14540            PO,     LOAD-ERROR(TEST551C),                 !ERROR DIRECTORY KEY
14541                    DCS-CTR(C15.),                        !HOLD UP FOR NOW
14542            NEXT,   BUTD[SCOPE],                          !NO ERROR:  "SETSR551C" (+1. WORDS)
14543                    J/SETSR551C                           !   ERROR:  "GOTEST551B" (-3. WORDS) REPEAT PREV TEST
     (4566)  DCS[1.00.1.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.001]
14544
14545    4561:
14546    SETSR551C:
14547            P2-T,   SR←SR-PLUS-1,                         !KEY IN SR<1:0>=(10) FOR SELECT THIS BUT
```

```
14548            NEXT,   GOTO-PAGE(5),                          !XFER
14549                    J/GOTEST551C                           !
     (4561)  DCS[0.00.0.0.0.0]  BM[1001..01.11..00.00..000..101...0.0.1..0..0...0.0000...0..0000.0...11.100...110.010.110]
14550
14551    5626:
14552    GOTEST551C:
14553            SETUP,  RETURN/SCOPE551,                       !GO TO TEST SUBROUTINE
14554            NEXT,   CALL[COUNT-TEST]                       !  (SEE DESCRIP, FOLLOWING)
     (5626)  DCS[0.00.0.0.0.0]  BM[0101..00.01..10.00..101..100...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
14555
14556
14557
14558    5305:  !(FREE)
14559    SCOPE551:
14560            PO,     BUSDIN←EMIT-[I],                       !RESET PROC UCON
14561                    EN-CLK-IR[15-00],                      !
14562            NEXT,   BUTD[SCOPE],                           !NO ERROR:  "TEST610A1"  (NEXT SECTION)
14563                    J/TEST610A1                            !   ERROR:  "GOTEST551C" (-1. WORDS) REPEAT PREV TEST
     (5305)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...110.010.111]
14564
14565
14566
14567    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14568
14569    !***   B.M. COUNTER TESTING ROUTINE   ***
14570
14571    !      THIS ROUTINE USES THE B.M. COUNTER TO COUNT FROM 000-377, WAITING FOR IT
14572    !      TO OVERFLOW AT THE RIGHT MOMENT.  AT THE SAME TIME THE D REGISTER HAS BEEN
14573    !      TRACKING THE PROGRESS OF THE COUNTER, WAITING FOR IT TO OVERFLOW, COMPARING
14574    !      COUNT FOR COUNT THE INCREMENTED VALUES, AND GUARANTEEING WE WILL EXIT THE
14575    !      LOOP IF THE COUNTER SOMEHOW NEVER OVERFLOWS.
14576
14577
14578    4301:  !(FREE)
14579    COUNTER01:
14580            P2,     COUNTER←BSPHI(C000000),                !LOAD COUNTER WITH (000) TO START
14581            NEXT,   J/COUNTER02                            !
     (4301)  DCS[0.00.0.0.0.0]  BM[0000..01.11..00.00..100..000...0.0.0..0..0...0.0000...0..0010.1...11.000...011.001.000]
14582
14583    4310:  !(FREE)
14584    COUNTER02:
14585            P2-T,   D←ZERO, D[C]←ALU15,                    !ZERO D, D[C]
14586            P3,     A#BSPHI[17]←D,                         !ASPHI[17] WILL TRACK THE COUNTER
14587            NEXT,   J/COUNTER03                            !
     (4310)  DCS[0.00.0.0.0.0]  BM[0011..00.11..00.01..011..100...0.1.0..0..0...0.0000...0..1011.0...11.000...101.010.110]
14588
14589
14590    !***   THE LOOP FOR THE COUNTER TEST ENTERS HERE   ***
14591    4526:
14592    COUNTER03:
14593            P2-T,   D←A-XOR-B, SAVE-D[C],                  !COMPARE COUNTER:TRACKER
14594                    BUS-A, COUNT#D[LO],                    !=(COUNTER)#(000)
```

```
14595                   BUS-B←BSPHI(R17),                       !=(TRACKER)#(000)
14596           NEXT,   BUTR(D[C]-B),                           !D[C] HOLDS THE CARRYOUT FROM THE TRACKING REGISTER
14597                                                           !IF (0), GOTO(COUNTER04), CONTINUE TESTING
14598                   J/COUNTER04                             !IF (1), GOTO(COUNTER11), ERROR, D OVERFLOW BEFORE COUNTER
    (4526)  DCS[0.00.0.0.0.0]  BM[0110..01.11..01.01..011..111...0.1.0..0..0...0.0011...0..0000.0...10.011...101.100.101]
14599
14600
14601   !ENTER HERE FOR CONTINUE TEST
14602   4545:
14603   COUNTER04:
14604           PD,     DCS-CTR(C5,),                           !HOLD UP ON DCS COMPARE
14605           NEXT,   BUTR(D14-00-EQ-0),                      !COMPARE COUNTER:TRACKER, GENERATED ABOVE
14606                                                           !IF  EQUAL, GOTO(COUNTER05), CONTINUE TEST
14607                   J/COUNTER12                             !IF NOT EQUAL, GOTO(COUNTER12), COUNTER#TRACKER ERROR
    (4545)  DCS[0.00.1.0.0.0]  BM[1010..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.101...101.101.101]
14608
14609
14610   !ENTER HERE FOR CONTINUE TEST
14611   4557:
14612   COUNTER05:
14613           P2-T,   D←ZERO, D[C]←ALU15,                     !TRY TO FORCE EXIT
14614           NEXT,   BUTR(CASE),                             !DETERMINE WHO TO TEST:
14615                                                           !SR=0 -> COUNTER06
14616                                                           !SR=1 -> COUNTER07
14617                   J/COUNTER06                             !SR=2 -> COUNTER08    (SR=3 NOT USED)
    (4557)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..100...0.1.0..0..0...0.0000...0..0000.0...00.000...101.011.100]
14618
14619   !ENTER HERE FOR SR=0
14620   4534:
14621   COUNTER06:
14622           P2-T,   D←A-PLUS-B, D[C]←COUT15,                !INCREMENT TRACKING REGISTER
14623                   BUS-A←ASPHI(R17),                       !
14624                   BUS-B←CSPD(D17),                        !CONSTANT (400)
14625           P3,     A#BSPHI[17]←D,                          !SAVE NEW
14626           NEXT,   BUTA(SR1-0#COUNT-IS-377),               !IF SET, GOTO(COUNTER10), B.M. COUNTER OVERFLOWED
14627                   J/COUNTER03                             !IF CLEAR, GOTO(COUNTER03), NEXT PASS THRU TEST
    (4534)  DCS[0.00.0.0.0.0]  BM[1001..10.11..11.01..011..110...0.1.0..0..0...0.0000...0..1011.0...01.011...101.010.110]
14628
14629   !ENTER HERE FOR SR=1
14630   4535:
14631   COUNTER07:
14632           P2-T,   D←A-PLUS-B, D[C]←COUT15,                !INCREMENT TRACKING REGISTER
14633                   BUS-A←ASPHI(R17),                       !
14634                   BUS-B←CSPD(D17),                        !CONSTANT (400)
14635           P3,     A#BSPHI[17]←D,                          !SAVE NEW
14636           NEXT,   BUTA(COUNT-IS-377),                     !IF SET, GOTO(COUNTER10), B.M. COUNTER OVERFLOWED
14637                   J/COUNTER03                             !IF CLEAR, GOTO(COUNTER03), NEXT PASS THRU TEST
    (4535)  DCS[0.00.0.0.0.0]  BM[1001..10.11..11.01..011..110...0.1.0..0..0...0.0000...0..1011.0...10.101...101.010.110]
14638
14639   !ENTER HERE FOR SR=2
14640   4536:
14641   COUNTER08:
14642           P2-T,   D←A-PLUS-B, D[C]←COUT15,                !INCREMENT TRACKING REGISTER
14643                   BUS-A←ASPHI(R17),                       !
```

```
14644                   BUS-B←CSPD(D17),                                !CONSTANT (400)
14645             P3,   A←BSPHI[17]←D,                                  !SAVE NEW
14646             NEXT, BUTA(COUNT-IS-377←D[C]),                        !IF SET, GOTO(COUNTER10), B.M. COUNTER OVERFLOWED
14647                   J/COUNTER09                                     !IF CLEAR, GOTO(COUNTER09), NEXT PASS THRU TEST
     (4536)  DCS[0.00.0.0.0.0]  BM[1001..10.11..11.01..011..110...0.1.0..0..0...0.0000...0..1011.0...01.111...101.010.101]
14648
14649
14650     !INTERMEDIATE WORD FOR NEXT PASS
14651     4525:
14652     COUNTER09:
14653           NEXT,   J/COUNTER03                                     !NEXT PASS
     (4525)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.010.110]
14654
14655
14656
14657     !     -     -     -     -     -     -     -     -     -     -     -
14658
14659     !ENTER THIS SECTION WHEN HIT AN END CONDITION:
14660
14661     !ENTER HERE WHEN COUNTER SIGNALS IT HAS OVERFLOWN:
14662     4527:
14663     COUNTER10:
14664           PO,     DCS-CTR(C15.),                                  !HOLD UP
14665           NEXT,   BUTR(D[C]-B),                                   !NOW TEST THAT D HAS ALSO OVERFLOWED, AT THE SAME TIME
14666                                                                   !IF TRUE, GOTO(COUNTER10A),  ALL IS OK, END THE TEST
14667                   J/COUNTER10B                                    !IF FALSE, GOTO(COUNTER10B), ERROR, COUNTER OVERFLOWED TOO SOON
     (4527)  DCS[0.00.1.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.011...101.011.001]
14668
14669       4533:
14670       COUNTER10A:
14671             PO,     DCS-CTR(C15.),                                !ALL, END THE TEST WITH NO ERRORS
14672             NEXT,   BUTA(RETURN),                                 !
14673                     J/BUTERROR4                                   !
     (4533)  DCS[0.00.1.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
14674
14675       4531:
14676       COUNTER10B:
14677             PO,     DCS-CTR(C0.),                                 !FORCE ERROR NOW,
14678             NEXT,   BUTA(RETURN),                                 !  B.M. COUNTER OVERFLOWED TOO SOON
14679                     J/BUTERROR4                                   !
     (4531)  DCS[0.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
14680
14681     !ENTER HERE WHEN WE GET A "D OVERFLOWED BEFORE COUNTER" CONDITION
14682     4547:
14683     COUNTER11:
14684           PO,     DCS-CTR(C0.),                                   !FORCE ERROR NOW,
14685           NEXT,   BUTA(RETURN),                                   !  B.M. COUNTER DIDN'T OVERFLOW ON TIME
14686                   J/BUTERROR4                                     !
     (4547)  DCS[0.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
14687
14688     !ENTER HERE WHEN WE GET A "TRACKER : COUNTER" MISCOMPARE
14689     4555:
14690     COUNTER12:
14691           PO,     DCS-CTR(C0.),                                   !FORCE ERROR NOW,
```

```
14692            NEXT,   BUTA(RETURN),                          !  B.M. COUNTER DIDN'T INCREMENT IN STEP WITH TRACKER
14693                    J/BUTERROR4                            !
    (4555)  DCS[0.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
14694
14695
14696
14697
14698
14699    !.PAGE=========================================================================================================
14700
14701
14702    .TOC   *   TEST610:  CONDITION CODE LOGIC
14703
14704
14705
14706    !*************************************************************************************
14707    !*
14708    !*     TESTS:  610 A - D                                  UWORDS:  074 + 070
14709    !*
14710    !*     FUNCTIONS:
14711    !*
14712    !*     THE FOLLOWING EIGHT TESTS EXERCISE THE PSW CC LOGIC (THE NZVC BITS)
14713    !*     AND THE ASSOCIATED ROMS/MUXES ETC. TO VERIFY THE ABSCENCE OF STUCK
14714    !*     ONE/ZERO CONDITIONS ON ALL LOGIC LINES.
14715    !*
14716    !*************************************************************************************
14717    !
14718    !      SUMMARY OF CC-LOGIC TESTS:
14719    !
14720    !      TEST  ROM     IR     CC                                          MODIFY  PREV  GENERATED
14721    !      NUMB  ADR    DATA  CLASS BYTE-H  D[C]/D-REG A-SIDE B-SIDE       VBIT-H  NZVC   NZVC
14722    !      ----  ---   ------ ----- ------  ---------- ------ ------       ------  ----   ----
14723    !
14724    !       A1   665   105200  010     1     1-100000 177700 100100         1     1010   0101
14725    !       A2   145   105200  010     1     0-100000 077600 000200         0     1001   0110
14726    !
14727    !       B1   132   105300  101     1     1-000200 100000 000200         0     0100   1011
14728    !       B2   253   005300  101     0     0-000000 100200 000200         1     1001   0110
14729    !
14730    !       C1   437   072000  111     0     1-000000 000200 000200         0     1010   0111
14731    !       C2   037   072000  111     0     1-077776 037777 037777         0     1100   0001
14732    !
14733    !       D1   216   072000  111     0     0-177400 077600 077600         1     0101   1000
14734    !       D2   116   072000  111     0     0-100000 000200 100200         0     0101   1000
14735    !
14736    !
14737
14738
14739    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14740
14741    !*** TEST 610A1 ***
14742
14743    5627:
14744    TEST610A1:
```

```
14745            P0,     LOAD-ENUA(ZTARGET405),                  !NZVC AFTER = "0101"
14746                    LOAD-ERROR(TEST610A1),                  !ERROR DIRECTORY KEY
14747                    DCS-CTR(C15.),                          !COMPARE AT TARGET
14748                    BUMP-VERIFY,                            !COUNT
14749            NEXT,   J/LOADIR610A1                           !
     (5627)  DCS[1.00.1.0.0.1]  BM[0000..00.11..11.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.010]
14750
14751    5532:
14752    LOADIR610A1:
14753            P0,     BUMP-VERIFY,                            !COUNT
14754            P2-U,   IR←EMIT, EMIT/105200,                   !(105200)=INCB, CC-CLASS="010", BYTE-H
14755            NEXT,   J/LOAD01-610A1                          !
     (5532)  DCS[0.00.0.0.0.1]  BM[1000..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.000.110]
14756
14757    5306:  !(FREE)
14758    LOAD01-610A1:
14759            P0,     BUMP-VERIFY,                            !COUNT
14760            P3,     CSPD[01]←EMIT, EMIT/100012,             !FOR D[C]=(1), PS[NZVC]="1010" PREVIOUSLY
14761            NEXT,   J/LOAD05-610A1                          !
     (5306)  DCS[0.00.0.0.0.1]  BM[1000..10.00..00.00..001..010...0.0.0..0..0...0.1110...1..0000.0...11.000...011.000.111]
14762
14763    5307:  !(FREE)
14764    LOAD05-610A1:
14765            P3,     CSPD[05]←EMIT, EMIT/177700,             !A-SIDE DATA
14766            NEXT,   J/LOAD06-610A1                          !
     (5307)  DCS[0.00.0.0.0.0]  BM[1111..10.11..11.11..000..000...0.0.0..0..0...0.1010...1..0000.0...11.000...011.001.000]
14767
14768    5310:  !(FREE)
14769    LOAD06-610A1:
14770            P3,     CSPD[06]←EMIT, EMIT/100100,             !B-SIDE DATA
14771            NEXT,   J/PSCC-DC610A1                          !
     (5310)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.01..000..000...0.0.0..0..0...0.1001...1..0000.0...11.000...011.001.001]
14772
14773    5311:  !(FREE)
14774    PSCC-DC610A1:
14775            SETUP,  RETURN/SETBUSA610A1,                    !EXEC SUBR WHICH:
14776                                                            !(1) CSP(10)<3:0> -> PS[NZVC]
14777            NEXT,   CALL[SETUPPSCC#DC]                      !(2) CSP(10)<15> -> D[C]
     (5311)  DCS[0.00.0.0.0.0]  BM[0101..00.01..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]
14778
14779    5312:  !(FREE)
14780    SETBUSA610A1:
14781            P2-T,   SR←CSPD(D05),                           !GET CONSTANT FOR A-SIDE WHEN CC SET
14782            NEXT,   J/DOIT610A1                             !
     (5312)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1010...0..0000.0...11.000...011.001.011]
14783
14784    5313:  !(FREE)
14785    DOIT610A1:
14786            SETUP,  SET-CC,                                 !FOR CLOCKING CC-S IN NEXT UWORD
14787                    MODIFY-VBIT,                            !EXTRA CC ROM INPUT
14788            P2-T,   D←A-PLUS-B, SAVE-D[C],                  !D=(100000), D[C]=(1)
14789                    BUS-A←SR,                               !A=(177700)
14790                    BUS-B←CSPD(DC6),                        !B=(100100)
```

```
14791            NEXT,   J/GETIT610A1                                    !
     (5313)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.10..000..111...0.1.0..0..1...0.1001...0..0000.0...11.000...011.001.100]
14792
14793     5314:  !(FREE)
14794     GETIT610A1:
14795            P2-T,   CLK-CC,                                         !PS[NZVC] GENERATED ABOVE LATCHED HERE
14796            SETUP,  RETURN/TEST610A2,                               !EXEC SUBR WHICH:
14797            NEXT,   CALL[PSCCTOSR3-0]                               !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
     (5314)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]
14798
14799
14800
14801     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14802
14803     !*** TEST 610A2 ***
14804
14805     5622:
14806     TEST610A2:
14807            P0,     LOAD-ENUA(ZTARGET406),                          !NZVC AFTER = "0110"
14808                    LOAD-ERROR(TEST610A2),                          !ERROR DIRECTORY KEY
14809                    DCS-CTR(C13.),                                  !COMPARE AT TARGET
14810            NEXT,   J/LOAD06-610A2                                  !
     (5622)  DCS[1.00.1.0.0.0]  BM[0010..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...011.001.101]
14811
14812     5315:  !(FREE)
14813     LOAD06-610A2:
14814            P0,     BUMP-VERIFY,                                    !COUNT
14815            P3,     CSPD[06]←EMIT, EMIT/077600,                     !A-SIDE DATA
14816            NEXT,   J/LOAD01-610A2                                  !
     (5315)  DCS[0.00.0.0.0.1]  BM[0111..10.11..11.10..000..000...0.0.0..0..0...0.1001...1..0000.0...11.000...011.001.110]
14817
14818     5316:  !(FREE)
14819     LOAD01-610A2:
14820            P3,     CSPD[01]←EMIT, EMIT/000011,                     !FOR D[C]=(0), PS[NZVC]="1001" PREVIOUSLY
14821            NEXT,   J/PSCC-DC610A2                                  !
     (5316)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..001..001...0.0.0..0..0...0.1110...1..0000.0...11.000...011.001.111]
14822
14823     5317:  !(FREE)
14824     PSCC-DC610A2:
14825            SETUP,  RETURN/SETBUSA610A2,                            !EXEC SUBR WHICH:
14826                                                                    !(1) CSP(10)<3:0> -> PS[NZVC]
14827            NEXT,   CALL[SETUPPSCC#DC]                              !(2) CSP(10)<15> -> D[C]
     (5317)  DCS[0.00.0.0.0.0]  BM[0101..00.01..10.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]
14828
14829     5320:  !(FREE)
14830     SETBUSA610A2:
14831            P2-T,   SR←CSPD(D06),                                   !GET CONSTANT FOR A-SIDE WHEN CC SET
14832            NEXT,   J/DOIT610A2                                     !
     (5320)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1001...0..0000.0...11.000...011.010.001]
14833
14834     5321:  !(FREE)
14835     DOIT610A2:
```

```
14836            SETUP,  SET-CC,                                  !FOR CLOCKING CC-S IN NEXT UWORD
14837                    NOT-MODIFY-VBIT,                         !EXTRA CC ROM INPUT
14838            P2-T,   D←A-PLUS-B, SAVE-D[C],                   !D=(100000), D[C]=(0)
14839                    BUS-A←SR,                                !A=(077600)
14840                    BUS-B←BSPHI(C000200),                    !B=(000200)
14841            NEXT,   J/GETIT610A2                             !
     (5321)  DCS[0.00.0.0.0.0]  BM[1001..01.11..00.00..010..111...0.1.0..0..1...0.0000...0..0000.0...11.000...011.010.010]
14842
14843    5322:  !(FREE)
14844    GETIT610A2:
14845            P2-T,   CLK-CC,                                  !PS[NZVC] GENERATED ABOVE LATCHED HERE
14846            SETUP,  RETURN/SCOPE610A,                        !EXEC SUBR WHICH:
14847            NEXT,   CALL[PSCCTOSR3-0]                        !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
     (5322)  DCS[0.00.0.0.0.0]  BM[0101..00.01..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]
14848
14849
14850
14851    5323:  !(FREE)
14852    SCOPE610A:
14853            P0,     BUMP-VERIFY,                             !COUNT
14854            NEXT,   BUTD[SCOPE],                             !NO ERROR:  "TEST610B1" (+1. WORDS)
14855                    J/TEST610B1                              !   ERROR:  "LOADIR610A1" (-15. WORDS)
     (5323)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.011]
14856
14857
14858
14859
14860
14861
14862
14863
14864    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14865
14866    !*** TEST 610B1 ***
14867
14868    5533:
14869    TEST610B1:
14870            P0,     LOAD-ENUA(ZTARGET413),                   !NZVC AFTER = "1011"
14871                    LOAD-ERROR(TEST610B1),                   !ERROR DIRECTORY KEY
14872                    DCS-CTR(C13.),                           !COMPARE AT TARGET
14873            NEXT,   J/LOADIR610B1                            !
     (5533)  DCS[1.00.1.0.0.0]  BM[0010..00.11..11.00..001..011...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.100]
14874
14875    5534:
14876    LOADIR610B1:
14877            P0,     BUMP-VERIFY,                             !COUNT
14878            P2-U,   IR←EMIT, EMIT/105300,                    !(105300)=DECB, CC-CLASS="101", BYTE-H
14879            NEXT,   J/LOAD01-610B1                           !
     (5534)  DCS[0.00.0.0.0.1]  BM[1000..00.10..10.11..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.010.100]
14880
14881    5324:  !(FREE)
14882    LOAD01-610B1:
14883            P3,     CSPD[011←EMIT, EMIT/100004,              !FOR D[C]=(1), PS[NZVC]="0100" PREVIOUSLY
```

```
14884            NEXT,   J/PSCC-DC61081                                  !
     (5324)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.00..000..100...0.0.0..0..0...0.1110...1..0000.0...11.000...011.010.101]
14885
14886     5325:  !(FREE)
14887     PSCC-DC61081:
14888            SETUP,  RETURN/SETBUSA61081,                            !EXEC SUBR WHICH:
14889                                                                    !(1) CSP(10)<3:0> -> PS[NZVC]
14890            NEXT,   CALL[SETUPPSCC#DC]                              !(2) CSP(10)<15> -> D[C]
     (5325)  DCS[0.00.0.0.0.0]  BM[0101..00.01..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]
14891
14892     5326:  !(FREE)
14893     SETBUSA61081:
14894            P2-T,   SR←BSPHI(C100000),                              !GET CONSTANT FOR A-SIDE WHEN CC SET
14895            NEXT,   J/DOIT61081                                     !
     (5326)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..001..000...0.0.1..0..0...0.0000...0..0000.0...11.000...011.010.111]
14896
14897     5327:  !(FREE)
14898     DOIT61081:
14899            SETUP,  SET-CC,                                         !FOR CLOCKING CC-S IN NEXT UWORD
14900                    NOT-MODIFY-VBIT,                                !EXTRA CC ROM INPUT
14901            P2-T,   D←NOT-A-AND-B, SAVE-D[C],                       !D=(000200), D[C]=(1)
14902                    BUS-A←SR,                                       !A=(100000)
14903                    BUS-B←BSPHI(C000200),                           !B=(000200)
14904            NEXT,   J/GETIT61081                                    !
     (5327)  DCS[0.00.0.0.0.0]  BM[0010..01.11..00.00..010..111...0.1.0..0..1...0.0000...0..0000.0...11.000...011.011.000]
14905
14906     5330:  !(FREE)
14907     GETIT61081:
14908            P2-T,   CLK-CC,                                         !PS[NZVC] GENERATED ABOVE LATCHED HERE
14909            SETUP,  RETURN/TEST61082,                               !EXEC SUBR WHICH:
14910            NEXT,   CALL[PSCCTOSR3-0]                               !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
     (5330)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]
14911
14912
14913
14914     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14915
14916     !*** TEST 61082 ***
14917
14918     5612:
14919     TEST61082:
14920            P0,     LOAD-ENUA(ZTARGET406),                          !NZVC AFTER = "0110"
14921                    LOAD-ERROR(TEST61082),                          !ERROR DIRECTORY KEY
14922                    DCS-CTR(C14.),                                  !COMPARE AT TARGET
14923            NEXT,   J/LOADIR61082                                   !
     (5612)  DCS[1.00.1.0.0.0]  BM[0001..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.001]
14924
14925     5331:  !(FREE)
14926     LOADIR61082:
14927            P0,     BUMP-VERIFY,                                    !COUNT
14928            P2-U,   IR←EMIT, EMIT/005300,                           !(005300)=DEC, CC-CLASS="101", NOT-BYTE-H
14929            NEXT,   J/LOAD07-61082                                  !
```

```
      (5331)  DCS[0.00.0.0.0.1]  BM[0000..00.10..10.11..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.011.010]
14930
14931    5332:  !(FREE)
14932    LOAD07-61082:
14933           P3,     CSPD[07]←EMIT, EMIT/100200,              !A-SIDE DATA
14934           NEXT,   J/LOAD01-61082                           !
      (5332)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.10..000..000...0.0.0..0..0...0.1000...1..0000.0...11.000...011.011.011]
14935
14936    5333:  !(FREE)
14937    LOAD01-61082:
14938           P3,     CSPD[01]←EMIT, EMIT/000011,              !FOR D[C]=(0), PS[NZVC]="1001" PREVIOUSLY
14939           NEXT,   J/PSCC-DC61082                           !
      (5333)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..001..001...0.0.0..0..0...0.1110...1..0000.0...11.000...011.011.100]
14940
14941    5334:  !(FREE)
14942    PSCC-DC61082:
14943           SETUP,  RETURN/SETBUSA61082,                     !EXEC SUBR WHICH:
14944                                                            !(1) CSP(10)<3:0> -> PS[NZVC]
14945           NEXT,   CALL[SETUPPSCC#DC]                       !(2) CSP(10)<15> -> D[C]
      (5334)  DCS[0.00.0.0.0.0]  BM[0101..00.01..10.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]
14946
14947    5335:  !(FREE)
14948    SETBUSA61082:
14949           P2-T,   SR←CSPD(D07),                            !GET CONSTANT FOR A-SIDE WHEN CC SET
14950           NEXT,   J/DOIT61082                              !
      (5335)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1000...0..0000.0...11.000...011.011.110]
14951
14952    5336:  !(FREE)
14953    DOIT61082:
14954           SETUP,  SET-CC,                                  !FOR CLOCKING CC-S IN NEXT UWORD
14955                   MODIFY-VBIT,                             !EXTRA CC ROM INPUT
14956           P2-T,   D←NOT-A-AND-B, SAVE-D[C],                !D=(000000), D[C]=(0)
14957                   BUS-A←SR,                                !A=(100200)
14958                   BUS-B←BSPHI(C000200),                    !B=(000200)
14959           NEXT,   J/GETIT61082                             !
      (5336)  DCS[0.00.0.0.0.0]  BM[0010..01.11..00.10..010..111...0.1.0..0..1...0.0000...0..0000.0...11.000...011.011.111]
14960
14961    5337:  !(FREE)
14962    GETIT61082:
14963           P2-T,   CLK-CC,                                  !PS[NZVC] GENERATED ABOVE LATCHED HERE
14964           SETUP,  RETURN/SCOPE610B,                        !EXEC SUBR WHICH:
14965           NEXT,   CALL[PSCCTOSR3-0]                        !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
      (5337)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]
14966
14967
14968
14969    5340:  !(FREE)
14970    SCOPE610B:
14971           P0,     BUMP-VERIFY,                             !COUNT
14972           NEXT,   BUTD[SCOPE],                             !NO ERROR:  "TEST610C1" (+1. WORDS)
14973                   J/TEST610C1                              !   ERROR:  "LOADIR610B1" (-14. WORDS)
      (5340)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.011.101]
```

```
14974
14975
14976
14977
14978
14979
14980
14981
14982    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
14983
14984    !*** TEST 610C1 ***
14985
14986    5535:
14987    TEST610C1:
14988            PO,     LOAD-EMUA(ZTARGET407),                  !NZVC AFTER = "0111"
14989                    LOAD-ERROR(TEST610C1),                  !ERROR DIRECTORY KEY
14990                    DCS-CTR(C13.),                          !COMPARE AT TARGET
14991            NEXT,   J/LOADIR610C1                           !
     (5535)  DCS[1.00.1.0.0.0]  BM[0010..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.100]
14992
14993    5544:
14994    LOADIR610C1:
14995            PO,     BUMP-VERIFY,                            !COUNT
14996            P2-U,   IR←EMIT, EMIT/072000,                   !(072000)=ASH, CC-CLASS="111", NOT-BYTE-H
14997            NEXT,   J/LOAD01-610C1                          !
     (5544)  DCS[0.00.0.0.0.1]  BM[0111..00.01..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.100.001]
14998
14999    5341:  !(FREE)
15000    LOAD01-610C1:
15001            P3,     CSPD[01]←EMIT, EMIT/100012,             !FOR D[C]=(1), PS[NZVC]="1010" PREVIOUSLY
15002            NEXT,   J/PSCC-DC610C1                          !
     (5341)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.00..001..010...0.0.0..0..0...0.1110...1..0000.0...11.000...011.100.010]
15003
15004    5342:  !(FREE)
15005    PSCC-DC610C1:
15006            SETUP,  RETURN/SETBUSA610C1,                    !EXEC SUBR WHICH:
15007                                                            !(1) CSP(10)<3:0> -> PS[NZVC]
15008            NEXT,   CALL[SETUPPSCC#DC]                      !(2) CSP(10)<15> -> D[C]
     (5342)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]
15009
15010    5343:  !(FREE)
15011    SETBUSA610C1:
15012            P2-T,   SR←BSPHI(C000200),                      !GET CONSTANT FOR A-SIDE WHEN CC SET
15013            NEXT,   J/DOIT610C1                             !
     (5343)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..010..000...0.0.1..0..0...0.0000...0..0000.0...11.000...011.100.100]
15014
15015    5344:  !(FREE)
15016    DOIT610C1:
15017            SETUP,  SET-CC,                                 !FOR CLOCKING CC-S IN NEXT UWORD
15018                    NOT-MODIFY-VBIT,                        !EXTRA CC ROM INPUT
15019            P2-T,   D←A-XOR-B, SAVE-D[C],                   !D=(000000), D[C]=(1)
15020                    BUS-A←SR,                               !A=(000200)
15021                    BUS-B←BSPHI(C000200),                   !B=(000200)
```

```
15022            NEXT,   J/GETIT610C1                                    !
     (5344)  DCS[0.00.0.0.0.0]  BM[0110..01.11..00.00..010..111...0.1.0..0..1...0.0000...0..0000.0...11.000...011.100.101]
15023
15024     5345:  !(FREE)
15025     GETIT610C1:
15026            P2-T,   CLK-CC,                                         !PS[NZVC] GENERATED ABOVE LATCHED HERE
15027            SETUP,  RETURN/TEST610C2,                               !EXEC SUBR WHICH:
15028            NEXT,   CALL[PSCCTOSR3-0]                               !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
     (5345)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.00..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]
15029
15030
15031
15032
15033     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15034
15035     !*** TEST 610C2 ***
15036
15037     5602:
15038     TEST610C2:
15039            P0,     LOAD-ENUA(ZTARGET401),                          !NZVC AFTER = "0001"
15040                    LOAD-ERROR(TEST610C2),                          !ERROR DIRECTORY KEY
15041                    DCS-CTR(C13.),                                  !COMPARE AT TARGET
15042            NEXT,   J/LOAD05-610C2                                  !
     (5602)  DCS[1.00.1.0.0.0]  BM[0010..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.110]
15043
15044     5346:  !(FREE)
15045     LOAD05-610C2:
15046            P0,     BUMP-VERIFY,                                    !COUNT
15047            P3,     CSPD[05]←EMIT, EMIT/037777,                     !A AND B SIDE DATA
15048            NEXT,   J/LOAD01-610C2                                  !
     (5346)  DCS[0.00.0.0.0.1]  BM[0011..10.11..11.11..111..111...0.0.0..0..0...0.1010...1..0000.0...11.000...011.100.111]
15049
15050     5347:  !(FREE)
15051     LOAD01-610C2:
15052            P3,     CSPD[01]←EMIT, EMIT/100014,                     !FOR D[C]=(1), PS[NZVC]="1100" PREVIOUSLY
15053            NEXT,   J/PSCC-DC610C2                                  !
     (5347)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.00..001..100...0.0.0..0..0...0.1110...1..0000.0...11.000...011.101.000]
15054
15055     5350:  !(FREE)
15056     PSCC-DC610C2:
15057            SETUP,  RETURN/SETBUSA610C2,                            !EXEC SUBR WHICH:
15058                                                                    !(1) CSP(10)<3:0> -> PS[NZVC]
15059            NEXT,   CALL[SETUPPSCC#DC]                              !(2) CSP(10)<15> -> D[C]
     (5350)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]
15060
15061     5351:  !(FREE)
15062     SETBUSA610C2:
15063            P2-T,   SR←CSPD(D05),                                   !GET CONSTANT FOR A-SIDE WHEN CC SET
15064            NEXT,   J/DOIT610C2                                     !
     (5351)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1010...0..0000.0...11.000...011.101.010]
15065
15066     5352:  !(FREE)
```

```
15067    DOIT610C2:
15068            SETUP,  SET-CC,                                  !FOR CLOCKING CC-S IN NEXT UWORD
15069                    NOT-MODIFY-VBIT,                         !EXTRA CC ROM INPUT
15070            P2-T,   D←A-PLUS-B, SAVE-D[C],                   !D=(077776), D[C]=(1)
15071                    BUS-A←SR,                                !A=(037777)
15072                    BUS-B←CSPD(D05),                         !B=(037777)
15073            NEXT,   J/GETIT610C2                             !
     (5352)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.00..000..111...0.1.0..0..1...0.1010...0..0000.0...11.000...011.101.011]
15074
15075    5353:  !(FREE)
15076    GETIT610C2:
15077            P2-T,   CLK-CC,                                  !PS[NZVC] GENERATED ABOVE LATCHED HERE
15078            SETUP,  RETURN/SCOPE610C,                        !EXEC SUBR WHICH:
15079            NEXT,   CALL[PSCCTOSR3-0]                        !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
     (5353)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]
15080
15081
15082
15083    5354:  !(FREE)
15084    SCOPE610C:
15085            P0,     BUMP-VERIFY,                             !COUNT
15086            NEXT,   BUTD[SCOPE],                             !NO ERROR:  "TEST610D1" (+1. WORDS)
15087                    J/TEST610D1                              !   ERROR:  "LOADIR610C1" (-13. WORDS)
     (5354)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.100.101]
15088
15089
15090
15091
15092
15093
15094
15095
15096    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15097
15098    !*** TEST 610D1 ***
15099
15100    5545:
15101    TEST610D1:
15102            P0,     LOAD-ENUA(ZTARGET410),                   !NZVC AFTER = "1000"
15103                    LOAD-ERROR(TEST610D1),                   !ERROR DIRECTORY KEY
15104                    DCS-CTR(C12.),                           !COMPARE AT TARGET
15105            NEXT,   J/LOAD01-610D1                           !
     (5545)  DCS[1.00.1.0.0.0]  BM[0011..00.11..11.00..001..000...0.0.0..0..0...0.0000...0..0000.0...11.000...101.001.000]
15106
15107    5510:
15108    LOAD01-610D1:
15109            P3,     CSPD[01]←EMIT, EMIT/000005,              !FOR D[C]=(0), PS[NZVC]="0101" PREVIOUSLY
15110            NEXT,   J/PSCC-DC610D1                           !
     (5510)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..101...0.0.0..0..0...0.1110...1..0000.0...11.000...011.101.101]
15111
15112    5355:  !(FREE)
15113    PSCC-DC610D1:
15114            SETUP,  RETURN/SETBUSA610D1,                     !EXEC SUBR WHICH:
```

```
15115                                                                   !(1) CSP(10)<3:0> -> PS[NZVC]
15116           NEXT,   CALL[SETUPPSCC#DC]                              !(2) CSP(10)<15> -> D[C]
     (5355)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]
15117
15118    5356:  !(FREE)
15119    SETBUSA610D1:
15120           P2-T,   SR←CSPD(D06),                                   !GET CONSTANT FOR A-SIDE WHEN CC SET
15121           NEXT,   J/DOIT610D1                                     !
     (5356)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1001...0..0000.0...11.000...011.101.111]
15122
15123    5357:  !(FREE)
15124    DOIT610D1:
15125           SETUP,  SET-CC,                                         !FOR CLOCKING CC-S IN NEXT UWORD
15126                   MODIFY-VBIT,                                    !EXTRA CC ROM INPUT
15127           P2-T,   D←A-PLUS-B,'SAVE-D[C],                          !D=(177400), D[C]=(0)
15128                   BUS-A←SR,                                       !A=(077600)
15129                   BUS-B←CSPD(D06),                                !B=(077600)
15130           NEXT,   J/GETIT610D1                                    !
     (5357)  DCS[0.00.0.0.0.0]  BM[1001..10.00..00.10..000..111...0.1.0..0..1...0.1001...0..0000.0...11.000...011.110.000]
15131
15132    5360:  !(FREE)
15133    GETIT610D1:
15134           P2-T,   CLK-CC,                                         !PS[NZVC] GENERATED ABOVE LATCHED HERE
15135           SETUP,  RETURN/TEST610D2,                               !EXEC SUBR WHICH:
15136           NEXT,   CALL[PSCCTOSR3-0]                               !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
     (5360)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]
15137
15138
15139
15140    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
15141
15142    !*** TEST 610D2 ***
15143
15144    5624:
15145    TEST610D2:
15146           P0,     LOAD-ENUA(ZTARGET410),                          !NZVC AFTER = "1000"
15147                   LOAD-ERROR(TEST610D2),                          !ERROR DIRECTORY KEY
15148                   DCS-CTR(C11.),                                  !COMPARE AT TARGET
15149           NEXT,   J/PSCC-DC610D2                                  !
     (5624)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..001..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.001]
15150
15151    5361:  !(FREE)
15152    PSCC-DC610D2:
15153           SETUP,  RETURN/SETBUSA610D2,                            !EXEC SUBR WHICH:
15154                                                                   !(1) CSP(10)<3:0> -> PS[NZVC]
15155           NEXT,   CALL[SETUPPSCC#DC]                              !(2) CSP(10)<15> -> D[C]
     (5361)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.101.110]
15156
15157    5362:  !(FREE)
15158    SETBUSA610D2:
15159           P2-T,   SR←BSPHI(C000200),                              !GET CONSTANT FOR A-SIDE WHEN CC SET
```

```
15160            NEXT,   J/DOIT6100D2                                    !
     (5362)  DCS[0.00.0.0.0.0]  BM[1010..01.11..00.00..010..000...0.0.1..0..0...0.0000...0..0000.0...11.000...011.110.011]
15161
15162     5363:  !(FREE)
15163     DOIT6100D2:
15164            SETUP,  SET-CC,                                         !FOR CLOCKING CC-S IN NEXT UWORD
15165                    NOT-MODIFY-VBIT,                                !EXTRA CC ROM INPUT
15166            P2-T,   D←NOT-A-AND-B, SAVE-D[C],                       !D=(100000), D[C]=(0)
15167                    BUS-A←SR,                                       !A=(000200)
15168                    BUS-B←CSPD(D07),                                !B=(100200)
15169            NEXT,   J/GETIT6100D2                                   !
     (5363)  DCS[0.00.0.0.0.0]  BM[0010..10.00..00.00..000..111...0.1.0..0..1...0.1000...0..0000.0...11.000...011.110.100]
15170
15171     5364:  !(FREE)
15172     GETIT6100D2:
15173            P2-T,   CLK-CC,                                         !PS[NZVC] GENERATED ABOVE LATCHED HERE
15174            SETUP,  RETURN/SCOPE6100,                               !EXEC SUBR WHICH:
15175            NEXT,   CALL[PSCCTOSR3-0]                               !  PS<3:0> -> SR<3:0>, J/BUT(SR3-0)
     (5364)  DCS[0.00.0.0.0.0]  BM[0101..00.01..11.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.110.010]
15176
15177
15178
15179     5365:  !(FREE)
15180     SCOPE6100:
15181            P0,     BUSDIN←EMIT-[I],                                !RESET PROC UCONS
15182                    EN-CLK-IR[15-00],                               !
15183            NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "TEST620A" (+6. WORDS)
15184                    J/TEST620A                                      !   ERROR:  "LOAD01-6100I" (-10. WORDS)
     (5365)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...101.001.001]
15185
15186
15187
15188
15189
15190
15191
15192     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
15193
15194     !       THESE TWO SUBROUTINES ARE USED IN THE ABOVE CC-LOGIC TESTS:
15195
15196     7156:  !(FREE)
15197     SETUPPSCC#DC:
15198            P2-T,   D←CSPD(D01), D[C]←ALU15,                        !SET D[C] FROM BIT<15>
15199            NEXT,   J/SETUPPSCC#DC02                                !
     (7156)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.0..0..0...0.1110...0..0000.0...11.000...001.110.001]
15200
15201     7161:  !(FREE)
15202     SETUPPSCC#DC02:
15203            P2,     PS[3-0]←D[3-0]-[I],                             !SET PS[CC] FROM BIT<03:00>
15204                    BUSDIN←PS-[I],                                  !SETUP BUSDIN TO READ PS
15205            NEXT,   BUTA(RETURN),                                   !AND RETURN
15206                    J/BUTERROR7                                     !ERROR IF HERE
     (7161)  DCS[0.00.0.0.0.0]  BM[1000..00.00..10.01..000..000...0.0.0..0..0...1.1011...0..0000.0...11.111...011.111.110]
```

```
15207
15208
15209
15210
15211    7162:  !(FREE)
15212    PSCCTOSR3-0:
15213           P3,     CSPD[03]←BUSDIN,                        !GET ENABLED PS INTO CSP
15214           NEXT,   J/PSCCTOSR3-0AA                         !
     (7162)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1100...1..0000.0...11.000...001.110.011]
15215
15216    7163:  !(FREE)
15217    PSCCTOSR3-0AA:
15218           P2-T,   SR←CSPD(D03),                           !MOVE PS[CC] TO SR<3:0>
15219           NEXT,   J/PSCCTOSR3-0BB                         !
     (7163)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1100...0..0000.0...11.000...001.110.100]
15220
15221    7164:  !(FREE)
15222    PSCCTOSR3-0BB:
15223           P0,     BUSDIN←EMIT-[I],                        !RESET EMIT FOR CONSTANTS
15224                   EN-CLK-IR[15-00],                       !AND IR LOADING
15225           NEXT,   J/BUTSR3-0                              !AND GO TEST THE BITS
     (7164)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...010.111.110]
15226
15227
15228
15229
15230
15231    !.PAGE=============================================================================================================
15232
15233
15234    .TOC   *   TEST620-624:  TESTING UBREAK AND JAMUPP
15235
15236    !*************************************************************************************************
15237    !*
15238    !*     TESTS:  620 - 624                                  UWORDS: 101 + 133
15239    !*
15240    !*     FUNCTIONS:
15241    !*
15242    !*     THE FOLLOWING GROUP OF TEST FORCES A JAMUPP CONDITION VIA THE UBREAK FACILITY.
15243    !*     TESTS ARE THEN PERFORMED ON JAMUPP RELATED SIDE EFFECTS:
15244    !*
15245    !*     ALL JAM CONDITION BITS CAN BE RESET; ACTIVE BUT ROM, CSP WRITE BIT ARE CLEARED
15246    !*     IN WORD WHICH JAM OCCURS; NON-INTERNAL-JAM IS SET; CUA IS LOCKED, UNLOCKED BY
15247    !*     BUTA(TRACK); PREFETCH*JAM SET/CLEARED.
15248    !*
15249    !*************************************************************************************************
15250
15251
15252
15253    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15254
15255    !*** TEST 620 ***
15256
15257    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```
15258
15259     !* PART A ***
15260     !TEST-620-A DOES A 'CLR-JAM-ERRORS' UCON-I-O FUNCTION, THEN CHECKS 'INIT JAM'=0
15261     5511:
15262     TEST620A:
15263             PO,     LOAD-ENUA(ZTARGET406),                  !EXPECTED ADDRESS AFTER 'BUT'
15264                     LOAD-ERROR(TEST620A),                   !ERROR DIRECTORY KEY
15265                     DCS-CTR(C5.),                           !COMPARE AT TARGET
15266             NEXT,   J/BCERC620A                             !
     (5511)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...101.111.000]
15267
15268     5570:
15269     BCERC620A:
15270             PO,     BUMP-VERIFY,                            !COUNT
15271             P2,     CLR-JAM-ERRORS-[I],                     !CLEAR OUT ERROR REGISTERS
15272             NEXT,   J/GOBUT620A                             !
     (5570)  DCS[0.00.0.0.0.1]  BM[0100..00.00..10.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...011.110.110]
15273
15274     5366:  !(FREE)
15275     GOBUT620A:
15276             SETUP,  RETURN/TEST620B,                        !RETURN TO START OF NEXT SUBTEST
15277             NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7,
15278                     J/BUTMINITJAM                           !GO DO MULTIPLE 'BUT' ON INIT JAM
     (5366)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.110]
15279
15280
15281     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15282
15283     !* PART B *
15284     !TEST-620-B CHECKS THAT 'OTHER-JAM-H'=0 ALSO
15285     5623:
15286     TEST620B:
15287             PO,     LOAD-ENUA(ZTARGET401),                  !BIT<01> CLEAR
15288                     LOAD-ERROR(TEST620B),                   !ERROR DIRECTORY KEY
15289                     DCS-CTR(C3.),                           !COMPARE AT TARGET
15290             NEXT,   J/GOBUT620B                             !
     (5623)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.111]
15291
15292     5367:  !(FREE)
15293     GOBUT620B:
15294             SETUP,  RETURN/TEST620C,                        !RETURN TO START OF NEXT SUBTEST
15295             NEXT,   GOTO-PAGE(7),                           !BUT TABLE IS ON PAGE 7
15296                     J/BUTOTHERJAM                           !GO DO BUT ON OTHER-JAM-H SIGNAL
     (5367)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.010]
15297
15298
15299     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15300
15301     !* PART C *
15302     !TEST-620-C CHECKS THAT STATUS MUX PORT 2 (JAM REG) READS (001000) WHEN RESET
15303     !       "CLEAR-JAM-ERRORS" FUNCTION CLEARS BITS<15,13,11,8-2,0> OF JAM-REG
15304     !       "CLR-YELLOW-ZONE" FUNCTION CLEARS BIT<12> OF JAM-REG
```

```
15305     !       BIT<9> IS ACTIVE LOW, READS AS "1"H
15306     !       BITS<10,1> READ "0" SINCE NO WCS PRESENT
15307     !       BIT<14> IS "0" ALWAYS
15308     5621:
15309     TEST620C:
15310             PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D<15:00>=0 TEST RESULT
15311                     LOAD-ERROR(TEST620C),                   !ERROR DIRECTORY KEY
15312                     DCS-CTR(C11.),                          !COMPARE AT TARGET
15313             P3,     BUTA(CLR-FLAG-RES-UCON),                !PUT EMIT ONTO BUSDIN, CLEAR OUT I-O UCON
15314             NEXT,   J/MASK620C                              !
     (5621)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00. 000..010...0.0.0..0..0...0.0000...0..0000.0...11.010...011.111.000]
15315
15316     5370:  !(FREE)
15317     MASK620C:
15318             PO,     BUMP-VERIFY,                            !COUNT
15319             P3,     CSPO[04]←EMIT,                          !DON'T NEED TO MASK ANYTHING
15320             EMITC,  EMIT/177777,                            !
15321             NEXT,   J/GETJAM620C                            !
     (5370)  DCS[0.00.0.0.0.1]  BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.1011...1..0000.0...11.000...011.111.001]
15322
15323     5371:  !(FREE)
15324     GETJAM620C:
15325             SETUP,  RETURN/TEST621A,                        !GO EXECUTE SUBR WHICH:
15326             PO,     BUMP-VERIFY,                            !COUNT
15327             NEXT,   CALL[CLRJAM700]                         !  (JAMREG)-XOR-CSP(02)/(001000) -> D, BUT(D=ZERO)
     (5371)  DCS[0.00.0.0.0.1]  BM[0101..00.11..00.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.101]
15328
15329
15330
15331
15332
15333     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15334
15335     !*** TEST 621 ***
15336     !CAUSE A MICROBREAK JAM, AND CHECK ALL THE APPROPRIATE SIGNALS ARE SET
15337
15338     !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15339
15340     !* PART A *
15341     !TEST-621-A CAUSES A MICROBREAK JAM AT A SPECIFIC MICROADDRESS, AND CHECKS
15342     !THAT THE MICROCODE JAMS TO LOCATION (4777) IMMEDIATELY
15343     5617:
15344     TEST621A:
15345             PO,     LOAD-ENUA(4777),                        !SETUP JAMUPP ADDRESS
15346                     LOAD-ERROR(TEST621A),                   !ERROR DIRECTORY KEY
15347                     DCS-CTR(C9.),                           !COMPARE AT JAMUPP WORD
15348             P3,     BUTA(CUA-TRACK),                        !RESET CUA TRACKING IF HASN'T BEEN
15349             NEXT,   J/CSP1L621A                             !
     (5617)  DCS[1.00.1.0.0.0]  BM[0110..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.001...011.111.010]
15350
15351     5372:  !(FREE)
15352     CSP1L621A:
15353             PO,     BUMP-VERIFY,                            !COUNT
```

```
15354            EMITC,   EMIT/100377,                                  !
15355            P2-U,    IR←EMIT,                                      !A BRANCH INSTR, SO 'PREFETCH H' = "0"
15356            P3,      CSPD[05]←EMIT,                                !FLAG<8>="1", FOR UBREAK EN; EXFLAG<2:1>="11", FOR ACTIVE BUT TEST
15357            NEXT,    J/SETBRK621A                                  !BIT00="1", FOR JAMUPP ROUTINE
     (5372)  DCS[0.00.0.0.0.1]  BM[1000..10.00..00.11..111..111...0.0.0..0..0...1.1010...1..0000.0...11.000...011.111.011]
15358                                                                   !NOTE CSPADDR(05)/UCON-OPERATION BIT OVERLAP
15359
15360    5373:  !(FREE)
15361    SETBRK621A:
15362            SELECT, UCON-PROC,                                     !PROCESSOR UCON:
15363            ENABLE, EN-CLK-UBREAK[11-00],                          !  FOR UBREAK REG LOAD
15364                    BUSDIN←EMIT[15-00],                            !  AND KEEP EMIT ON BUSDIN
15365            P0,     SET-UCON-CONTROL,                              !WRITE UCON REGISTER
15366            NEXT,   J/LODBRK621A                                   !
     (5373)  DCS[0.00.0.0.0.0]  BM[0000..01.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.100]
15367
15368    5374:  !(FREE)
15369    LODBRK621A:
15370            P2-T,   SR←ZERO,                                       !ZERO SR<00>, TO PREVENT SPURIOUS UBREAKS FROM GETTING THRU
15371                    UBREAK←BUSDIN[11-00],                          !LOAD MICROBREAK REGISTER
15372                    EMITML/5522,                                   !  WITH SELECTED ADDRESS FROM EMIT
15373            NEXT,   J/SETRET621A                                   !
     (5374)  DCS[0.00.0.0.0.0]  BM[0011..00.10..11.01..010..010...0.0.1..0..0...1.1010...0..0000.0...11.000...011.111.101]
15374
15375    5375:  !(FREE)
15376    SETRET621A:
15377            P0,     BUMP-VERIFY,                                   !COUNT
15378            P3,     CSPD[00]←EMIT, RETURN/TEST621B,                !RETURN ADDRESS FOR AFTER JAMUPP
15379            NEXT,   J/SETFLG621A                                   !
     (5375)  DCS[0.00.0.0.0.1]  BM[0101..10.11..00.01..011..000...0.0.0..0..0...0.1111...1..0000.0...11.000...011.111.111]
15380
15381    5377:  !(FREE)
15382    SETFLG621A:
15383            P2-T,   D←CSPD(005), D[C]←0,                           !GET VALUES TO LOAD INTO FLAGS
15384            P3,     ASPHI[16]←D,                                   !  AND SAVE IN ASP FOR COMPARE LATER
15385            NEXT,   J/LODFLG621A                                   !
     (5377)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..011..000...0.1.0..0..0...0.1010...0..1001.0...11.000...100.000.000]
15386
15387    5400:  !(FREE)
15388    LODFLG621A:
15389            P0,     BUSDIN←EMIT-[I],                               !KEEP IT ON
15390                    BUMP-VERIFY,                                   !COUNT
15391            P3,     FLAG[8-0]←D[15-8]-[I],                         !ENABLE U-BREAK, FLAG 8; SET EXFLAGS FOR LATER
15392            NEXT,   J/SETSR621A                                    !
     (5400)  DCS[0.00.0.0.0.1]  BM[0000..00.00..00.01..000..001...0.0.0..0..0...1.1011...0..0000.0...11.000...100.000.001]
15393
15394    5401:  !(FREE)
15395    SETSR621A:
15396            P2-T,   SR←CSPD(005),                                  !MAKE SR<00>=1, FOR JAMUPP EXPECTED
15397            NEXT,   J/UBRK621A                                     !(FOR UBREAK JAM EXPECTED)
     (5401)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1010...0..0000.0...11.000...101.010.010]
15398
15399    5522:
15400    UBRK621A:                                                      !*** MICROBREAK HERE ***
```

```
15401           P3-T,   D←ZERO, D[C]←ALU15,                     !UWORD LATCH FOR CLK-D NOT CLEARED, CLK-D SHOULD HAPPEN
15402                   BUTA(CLR-FLAG-RES-UCON),                !JAMUPP CLEAR SHOULD ZAP ACTIVE BUT LATCH, BUTA(CLR-...) SHOULDN'T HA
15403                                                           !CUA GETS LOCKED WITH UADDR OF THIS UWORD (5522) ON JAMUPP
15404                                                           !PREFETCH*JAM(1)H GETS PREFETCH-H (="0") AT JAMUPP
15405           P3,     CSPD[05]←EMIT, EMIT/030004,             !LATCH HOLDING "WRCSP" BIT SHOULD GET ZAPPED ON JAMUPP,
15406                                                           !  THIS WRITE SHOULDN'T HAPPEN
15407           NEXT,   J/ERROR621A                             !THIS UPF SHOULD NOT BE USED
    (5522)  DCS[0.00.0.0.0.0]  BM[0011..10.00..00.00..000..100...1.1.0..0..0...0.1010...1..0000.0...11.0100...110.001.101]
15408
15409
15410   !(4777)  JAMUPP001:  ***COMPARE ENABLED ABOVE DONE HERE***
15411   !                THIS WORD TESTS SR<00>, WHICH SHOULD BE SET
15412   !                IF SR<00>=1, GOTO(JAMUPP002B), IF SR<00>=0, GOTO(JAMUPP003) [ERROR]
15413   !                P3-T,   SR←D    SAVE OLD D IN SR, FOR NOW
15414   !
15415   !(4757)  JAMUPP002B:  P2-T,  D←CSPD(00)        GET RETURN ADDRESS INTO D
15416   !
15417   !(4XXX)  JAMUPP002C:  P0,    RETURN←D  LOAD RETURN ADDRESS
15418   !                     P2-T,  D←SR      RESTORE OLD D FROM SR
15419   !
15420   !(7XXX)  JAMUPP002D:  P2-T,  SR←ZERO,  ZERO OUT SR, JAMUPPS NOW ILLEGAL
15421   !                     NEXT,  BUTA(RETURN)       AND NOW RETURN
15422   !
15423
15424   !EXECUTE THE FOLLOWING WORD ONLY IF NO JAMUPP OCCURRED:
15425   5615:
15426   ERROR621A:
15427           P0,     LOAD-ENUA(0000),                        !FORCE ERROR
15428                   LOAD-ERROR(ERROR621A),                  !ERROR DIRECTORY KEY
15429                   DCS-CTR(C0.),                           !FORCE COMPARE AT P3-T
15430                   BUMP-VERIFY,                            !COUNT
15431           NEXT,   J/TEST621B                              !
    (5615)  DCS[1.00.1.0.0.1]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...110.001.011]
15432
15433
15434   !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15435
15436   !* PART B *
15437   !TEST-621-B CHECKS THAT D WAS ZEROED; IE, P3 PULSE WAS SUPPRESSED IN JAM WORD,
15438   !  BUT UWORD LATCH FOR CLK-D BIT NOT ZAPPED, SO BIT WAS SAVED FOR EXECUTE LATER
15439   5613:
15440   TEST621B:
15441           P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D = ZERO TEST
15442                   LOAD-ERROR(TEST621B),                   !ERROR DIRECTORY KEY
15443                   DCS-CTR(C3.),                           !COMPARE AT TARGET
15444           NEXT,   J/GOBUT621B                             !
    (5613)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.010]
15445
15446   5402:  !(FREE)
15447   GOBUT621B:
15448           SETUP,  RETURN/TEST621C,                        !RETURN TO START OF NEXT SUBTEST
15449           NEXT,   GOTO-PAGE(7),                           !BUT TABLE ON PAGE 7
15450                   J/BUTD-IS-ZERO                          !BUT ON D CONTENTS
```

```
      (5402)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
15451
15452
15453    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15454
15455    !* PART C *
15456    !TEST-621-C CHECKS THAT 'INIT JAM' STILL OFF
15457    5611:
15458    TEST621C:
15459            PO,     LOAD-ENUA(ZTARGET406),                  !BIT<00> CLEAR
15460                    LOAD-ERROR(TEST621C),                   !ERROR DIRECTORY KEY
15461                    DCS-CTR(C4.),                           !COMPARE AT TARGET
15462            NEXT,   J/GOBUT621C                             !
      (5611)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.011]
15463
15464    5403:  !(FREE)
15465    GOBUT621C:
15466            SETUP,  RETURN/TEST621D,                        !RETURN TO START OF NEXT SUBTEST
15467            NEXT,   GOTO-PAGE(7),                           !BUT TABLE ON PAGE 7
15468                    J/BUTMINITJAM                           !GO TEST INIT JAM
      (5403)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.110]
15469
15470
15471    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15472
15473    !* PART D *
15474    !TEST-621-D CHECKS THAT 'OTHER-JAM-H'=1, WAS SET FOR UBREAK
15475    5607:
15476    TEST621D:
15477            PO,     LOAD-ENUA(ZTARGET403),                  !BIT<01> SET
15478                    LOAD-ERROR(TEST621D),                   !ERROR DIRECTORY KEY
15479                    DCS-CTR(C3.),                           !COMPARE AT TARGET
15480            NEXT,   J/GOBUT621D                             !
      (5607)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.100]
15481
15482    5404:  !(FREE)
15483    GOBUT621D:
15484            SETUP,  RETURN/TEST621E,                        !RETURN TO START OF NEXT SUBTEST
15485            PO,     BUMP-VERIFY,                            !COUNT
15486            NEXT,   GOTO-PAGE(7),                           !BUT TABLE ON PAGE 7
15487                    J/BUTOTHERJAM                           !GO TEST 'OTHER-JAM-H' IS SET
      (5404)  DCS[0.00.0.0.0.1]  BM[0101..00.11..00.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.010]
15488
15489
15490    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15491
15492    !* PART E *
15493    !TEST-621-E CHECKS UBREAK ONLY BIT SET FROM UBREAK JAMUPP IN STATUS MUX PORT 2 (JAM REG)
15494    5605:
15495    TEST621E:
15496            PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D = ZERO COMPARE
15497                    LOAD-ERROR(TEST621E),                   !ERROR DIRECTORY KEY
```

```
15498                   DCS-CTR(C10.),                          !COMPARE AT TARGET
15499           NEXT,   J/EXPEC621E                             !
    (5605)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.101]
15500
15501   5405:  !(FREE)
15502   EXPEC621E:
15503           P3,     CSPD[02]←EMIT,                          !WHAT WE EXPECT TO SEE IN JAM IS:
15504           EMITC,  EMIT/001001,                            !  (001001),  UBREAK H IN BIT00
15505           NEXT,   J/GETJAM621E                            !
    (5405)  DCS[0.00.0.0.0.0]  BM[0000..10.00..10.00..000..001...0.0.0..0..0...0.1101...1..0000.0...11.000...100.000.110]
15506
15507   5406:  !(FREE)
15508   GETJAM621E:
15509           SETUP,  RETURN/TEST621F,                        !GO TO SUBR WHICH:
15510           NEXT,   CALL[JAMTOD]                            !  (JAMREG)-XOR-CSP(02) -> D, BUT(D=ZERO)
    (5406)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.00..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.110]
15511
15512
15513
15514   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15515
15516   !* PART F *
15517   !TEST-621-F CHECKS THAT THE RIGHT CUA WAS LOCKED, AND SHORT TERM FLAGS NOT CLEARED (IE,
15518   !  BUTA(CLR-FLAG-...) IN UBREAK WORD DIDN'T CLEAR EXFLAG1), INDICATING JAMUPP CLEAR L
15519   !  DID IN FACT ZAP THE ACTIVE BUT ROM LATCH.  ALSO PREFETCH*JAM(1)H GETS PREFETCH-H="0".
15520   5603:
15521   TEST621F:
15522           P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D = ZERO COMPARE
15523                   LOAD-ERROR(TEST621F),                   !ERROR DIRECTORY KEY
15524                   DCS-CTR(C10.),                          !COMPARE AT TARGET
15525           NEXT,   J/EXPEC621F                             !
    (5603)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.111]
15526
15527   5407:  !(FREE)
15528   EXPEC621F:
15529           P0,     BUMP-VERIFY,                            !COUNT
15530           P3,     CSPD[02]←EMIT,                          !(USE MASK OF ALL 1'S FROM BEFORE)
15531           EMITC,  EMIT/055226,                            !WHAT THE CUA-EXFLAG-FOVP PORT OF HBMUX SHOULD BE
15532           NEXT,   J/GETCUA621F                            !CUA=(5522), EXFLAG<2:1>="11", PREFETCH*JAM(1)H="0"
    (5407)  DCS[0.00.0.0.0.1]  BM[0101..10.10..10.10..010..110...0.0.0..0..0...0.1101...1..0000.0...11.000...100.001.000]
15533
15534   5410:  !(FREE)
15535   GETCUA621F:
15536           SETUP,  RETURN/TEST621G,                        !GO TO SUBR WHICH:
15537           P0,     BUMP-VERIFY,                            !COUNT
15538           NEXT,   CALL[CUATOD]                            !  (CUA)-XOR-CSP(02) -> D, BUT(D=ZERO)
    (5410)  DCS[0.00.0.0.0.1]  BM[0101..00.11..11.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.111]
15539
15540
15541
15542
15543
```

```
15544
15545    ! - - -
```

```
15591
15592
15593    ! - - -
```

```
15639
15640    5416:  !(FREE)
15641    BCERC622B:
15642            P2,     CLR-JAM-ERRORS-[I],                    !DO IT
15643            NEXT,   J/GOBUT622B                            !
     (5416)  DCS[0.00.0.0.0.0]  BM[0100..00.00..10.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...100.001.111]
15644
15645    5417:  !(FREE)
15646    GOBUT622B:
15647            SETUP,  RETURN/TEST622C,                       !RETURN TO START OF NEXT SUBTEST
15648            NEXT,   GOTO-PAGE(7),                          !BUT TABLE ON PAGE 7,
15649                    J/BUTOTHERJAM                          !TEST 'OTHER-JAM-H' NOW CLEAR
     (5417)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.010]
15650
15651
15652    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15653
15654    !* PART C *
15655    !TEST-622-C TESTS THAT STATUS MUX PORT 2 (JAM REG) READS (001000) WHEN RESET
15656    5575:
15657    TEST622C:
15658            P0,     LOAD-ENUA(ZTARGET402),                 !SETUP FOR D = ZERO TEST
15659                    LOAD-ERROR(TEST622C),                  !ERROR DIRECTORY KEY
15660                    DCS-CTR(C10.),                         !COMPARE AT TARGET
15661            P3,     BUTA(CLR-FLAG-RES-UCON),               !PUT EMIT ON BUSDIN, CLEAR SHORT TERM FLAGS
15662            NEXT,   J/GETJAM622C                           !
     (5575)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.010...100.010.000]
15663
15664    5420:  !(FREE)
15665    GETJAM622C:
15666            SETUP,  RETURN/TEST623,                        !GO TO SUBR WHICH:
15667            NEXT,   CALL[CLRJAMTOD]                        !  (JAMREG)-XOR-CSP(02)/(001000) -> D, BUT(D=ZERO)
     (5420)  DCS[0.00.0.0.0.0]  BM[0101..00.10..11.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.101]
15668
15669
15670
15671
15672
15673
15674
15675    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15676
15677    !*** TEST 623 ***
15678    !TEST-623 CHECKS THAT BUTA(CUA-TRACK) RESTARTS CUA TRACKING
15679    5573:
15680    TEST623:
15681            P0,     LOAD-ENUA(ZTARGET402),                 !SETUP FOR D = ZERO TEST
15682                    LOAD-ERROR(TEST623),                   !ERROR DIRECTORY KEY
15683                    DCS-CTR(C10.),                         !COMPARE AT TARGET
15684            P3,     BUTA(CUA-TRACK),                       !RESET TO TRACKING CUA MODE
15685            NEXT,   J/EXPEC623                             !
     (5573)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.001...100.010.001]
```

```
15686
15687     5421:  !(FREE)
15688     EXPEC623:
15689             P0,     BUMP-VERIFY,                                    !COUNT
15690             P3,     CSP0[02]←EMIT,                                  !(PREV MASK)
15691             EMITC,  EMIT/073734,                                    !CUA IS WORD WHICH LOADS CUA INTO CSP, ONLY
15692             NEXT,   J/GETCUA623                                     !  EXFLAG<1> CLEARED FROM BUTA(CLR-FLAG-...), ABOVE
     (5421)  DCS[0.00.0.0.0.1]  BM[0111..10.01..11.11..011..100...0.0.0..0..0...0.1101...1..0000.0...11.000...100.010.010]
15693
15694     5422:  !(FREE)
15695     GETCUA623:
15696             SETUP,  RETURN/SCOPE623,                                !GO TO SUBR WHICH:
15697                                                                     !  CUA=(WORD WHICH READS CUA), SINCE TRACKING RESET
15698             NEXT,   CALL[CUATOD]                                    !  (CUA)-XOR-CSP(02) -> D, BUT(D=ZERO)
     (5422)  DCS[0.00.0.0.0.0]  BM[0101..00.10..00.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.111]
15699
15700
15701     5423:  !(FREE)
15702     SCOPE623:
15703             P0,     BUSDIN←EMIT-[I],                                !RESET PROC UCONS
15704                     EN-CLK-IR[15-00],                               !IR GETS JUNK, BUT DON'T CARE
15705             P3,     FLAG[8-0]←D[15-8]-[I],                          !RESET FLAGS TO ALL ZERO
15706             NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "TEST624A" [+1. WORDS]
15707                     J/TEST624A                                      !   ERROR:  "BCERC620A" [-48. WORDS]
     (5423)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.01..000..101...0.0.0..0..0...1.1011...0..0000.0...11.000...101.111.001]
15708
15709
15710
15711
15712
15713     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15714
15715     !*** TEST 624 ***
15716     !DO ANOTHER UBREAK JAM, CHECK JAM OCCURS, AND THAT P2 IS SEEN IN JAM WORD
15717
15718     !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15719
15720     !* PART A *
15721     !TEST-624-A CAUSES A UBREAK JAM, AND CHECKS TO SEE IT OCCURS
15722
15723     5571:
15724     TEST624A:
15725             P0,     LOAD-ENUA(4777),                                !SETUP JAMUPP ADDRESS
15726                     LOAD-ERROR(TEST624A),                           !ERROR DIRECTORY KEY
15727                     DCS-CTR(C9.),                                   !COMPARE AT JAMUPP WORD
15728             NEXT,   J/LODIR624A                                     !
     (5571)  DCS[1.00.1.0.0.0]  BM[0110..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...101.110.010]
15729
15730     5562:
15731     LODIR624A:
15732             P2-U,   IR←EMIT,                                        !IR PATTERN ASSERTS PREFETCH-H:
15733                     EMIT/030603,                                    !  PREFETCH-H=(DOPH*MOVBL*SMOH*SR7L*DMOH*DR7L)
15734             P3,     FLAG[8-0]←D[15-8],                              !FLAGS GET D, WHICH IS ZERO
```

```
15735            NEXT,   J/SETBRK624A                                !       + (SOPH*NEGL*SBCL*RORL*ASRL*DMOH*DR7L)
     (5562)  DCS[0.00.0.0.0.0]  BM[0011..00.00..01.10..000..011...0.0.0..0..0...1.1010...0..0000.0...11.000...100.010.100]
15736
15737     5424:  !(FREE)
15738     SETBRK624A:
15739            SELECT, UCON-PROC,                                  !ENABLE PROCESSOR UCON:
15740            ENABLE, EN-CLK-UBREAK[11-00],                       !  EN UBREAK LOAD,
15741                    BUSDIN←EMIT[15-00],                         !  KEEP EMIT ON BUSDIN
15742            P0,     SET-UCON-CONTROL,                           !WRITE CONTROLS
15743                    BUMP-VERIFY,                                !COUNT
15744            NEXT,   J/LODBRK624A                                !
     (5424)  DCS[0.00.0.0.0.1]  BM[0000..01.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...100.010.101]
15745
15746     5425:  !(FREE)
15747     LODBRK624A:
15748            P0,     BUMP-VERIFY,                                !COUNT
15749            P2-T,   UBREAK←BUSDIN[11-00],                       !LOAD UBREAK REGISTER
15750                    EMITML/6255,                                !  WITH SELECTED ADDRESS FROM EMIT
15751            NEXT,   J/SETRET624A                                !
     (5425)  DCS[0.00.0.0.0.1]  BM[0000..00.11..00.10..101..101...0.0.0..0..0...1.1010...0..0000.0...11.000...100.010.110]
15752
15753     5426:  !(FREE)
15754     SETRET624A:
15755            P3,     CSPD[00]←EMIT, RETURN/TEST624B,             !RETURN ADDRESS FOR AFTER JAMUPP
15756            NEXT,   GOTO-PAGE(6),                               !  RETURN TO START OF NEXT SUBTEST
15757                    J/SETD624A                                  !
     (5426)  DCS[0.00.0.0.0.0]  BM[0101..10.10..11.10..101..110...0.0.0..0..0...0.1111...1..0000.0...11.100...011.000.110]
15758
15759     6306:  !(FREE)
15760     SETD624A:
15761            P2-T,   D←CSPD(D05), D[C]←ALU15,                    !SETUP D WITH VALUE TO GO INTO FLAGS<8:0>
15762            NEXT,   J/SETFLG624A                                !
     (6306)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..100...0.1.0..0..0...0.1010...0..0000.0...11.000...100.101.011]
15763
15764     6453:  !(FREE)
15765     SETFLG624A:
15766            P0,     BUSDIN←EMIT-[I],                            !KEEP IT ON
15767            P3,     FLAG[8-0]←D[15-8]-[I],                      !SET UBRK FLAG<8>
15768            NEXT,   J/SETSR624A                                 !
     (6453)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..001...0.0.0..0..0...1.1011...0..0000.0...11.000...100.101.100]
15769
15770     6454:  !(FREE)
15771     SETSR624A:
15772            P2-T,   SR←CSPD(D05),                               !SET SR<00>=1 FOR UBRK JAMUPP EXPECTED
15773            NEXT,   J/UBRK624A                                  !
     (6454)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1010...0..0000.0...11.000...010.101.101]
15774
15775     6255:
15776     UBRK624A:                                                  !*** MICROBREAK HERE ***
15777            P2-T,   D←ZERO, D[C]←ALU15,                         !P2 PULSE SHOULD OCCUR, SO D SHOULD BE ZEROED.
15778                                                                !CUA GETS LOCKED WITH UADDR OF THIS UWORD (6255) ON JAMUPP
15779                                                                !PREFETCH*JAM(1)H GETS PREFETCH-H (="1") AT JAMUPP
```

```
15780           P3,     FLAG[8-0]←D[15-8],                      !ZERO ALL THE FLAGS IN THIS UWORD.  THE UBREAK SHOULD
15781                                                           !STILL OCCUR, HOWEVER, AS IT LOOKS AT THE 'NUA'.
15782           NEXT,   J/ERROR624A                             !DPF SHOULD NOT BE USED.
     (6255)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..100...0.1.0..0..0...1.1010...0..0000.0...11.000...101.110.111]
15783
15784
15785   !(4777)  JAMUPP001:  ***COMPARE ENABLED ABOVE DONE HERE***
15786   !                    THIS WORD TESTS SR<00>, WHICH SHOULD BE SET
15787   !                    IF SR<00>=1, GOTO(JAMUPP002B), IF SR<00>=0, GOTO(JAMUPF003) [ERROR]
15788   !                    P3-T,   SR←D     SAVE OLD D IN SR, FOR NOW
15789   !
15790   !(4757)  JAMUPP002B:  P2-T,  D←CSPD(00)          GET RETURN ADDRESS INTO D
15791   !
15792   !(4XXX)  JAMUPP002C:  P0,    RETURN←D  LOAD RETURN ADDRESS
15793   !                     P2-T,  D←SR      RESTORE OLD D FROM SR
15794   !
15795   !(7XXX)  JAMUPP002D:  P2-T,  SR←ZERO,  ZERO OUT SR, JAMUPPS NOW ILLEGAL
15796   !                     NEXT,  BUTA(RETURN)       AND NOW RETURN
15797   !
15798
15799
15800
15801   !EXECUTE THE FOLLOWING WORD ONLY IF NO JAMUPP OCCURRED:
15802   6567:
15803   ERROR624A:
15804           P0,     LOAD-ENUA(0005),                        !FORCE ERROR
15805                   LOAD-ERROR(ERROR624A),                  !ERROR DIRECTORY KEY
15806                   DCS-CTR(C0.),                           !FORCE COMPARE AT P3-T
15807                   BUMP-VERIFY,                            !COUNT
15808           NEXT,   GOTO-PAGE(5),                           !XFER TO 5
15809                   J/TEST624B                              !
     (6567)  DCS[1.00.1.0.0.1]  BM[1111..00.00..00.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.100...101.110.101]
15810
15811
15812   !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15813
15814   !* PART B *
15815   !TEST-624-B CHECKS THAT D WAS ZEROED, IE, P2 DID OCCUR IN JAM WORD
15816   5565:
15817   TEST624B:
15818           P0,     LOAD-ENUA(ZTARGET434),                   !SETUP FOR IR=ZERO TEST
15819                   LOAD-ERROR(TEST624B),                   !ERROR DIRECTORY KEY
15820                   DCS-CTR(C6.),                           !COMPARE AT TARGET
15821           NEXT,   J/ZEROIR624B                            !
     (5565)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..011..100...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.111]
15822
15823   5427:  !(FREE)
15824   ZEROIR624B:
15825           SETUP,  RETURN/TEST624C,                        !PUT THE ZEROES IN D INTO THE IR,
15826           NEXT,   CALL[DINTOIR-5]                         !  TO NEGATE PREFETCH-H  (000000)=HALT
     (5427)  DCS[0.00.0.0.0.0]  BM[0101..00.11..11.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.011]
15827
```

```
15828
15829
15830
15831    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15832
15833    !* PART C *
15834    !TEST-624-C CHECKS THAT THE RIGHT CUA WAS LOCKED,
15835    !THAT THE EXFLAGS<2:1>H READ AS "00" , AND
15836    !THAT PREFETCH*JAM(1)H = "1" , FROM TEST-624-A, EVEN THOUGH TEST-624-B
15837    !  RESET THE IR SO THAT PREFETCH-H="0"
15838    5776:
15839    TEST624C:
15840            PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D = ZERO COMPARE
15841                    LOAD-ERROR(TEST624C),                   !ERROR DIRECTORY KEY
15842                    DCS-CTR(C10.),                          !COMPARE AT TARGET
15843            NEXT,   J/EXPEC624C                             !
    (5776)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.000]
15844
15845    5430:  !(FREE)
15846    EXPEC624C:
15847            P3,     CSPD[02]←EMIT,                          !(USE MASK OF ALL 1'S FROM BEFORE)
15848                    EMIT/062551,                            !WHAT THE CUA-EXFLAG-FOVP PORT OF HBMUX SHOULD BE
15849            NEXT,   J/GETCUA624C                            !CUA=(6255), EXFLAG="00", PREFETCH*JAM(1)H="1"
    (5430)  DCS[0.00.0.0.0.0]  BM[0110..10.01..01.01..101..001...0.0.0..0..0...0.1101...1..0000.0...11.000...100.011.001]
15850
15851    5431:  !(FREE)
15852    GETCUA624C:
15853            SETUP,  RETURN/TEST624D,                        !GO TO SUBR WHICH:
15854            PO,     BUMP-VERIFY,                            !COUNT
15855            NEXT,   CALL[CUATOD]                            !  (CUA)-XOR-CSP(02) -> D, BUT(D=ZERO)
    (5431)  DCS[0.00.0.0.0.1]  BM[0101..00.11..11.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.111]
15856
15857
15858
15859    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15860
15861    !* PART D *
15862    !TEST-624-D CHECKS THAT 'PREFETCH*JAM(1)H' GOT 'PREFETCH-H'="1" AFTER JAMUPP
15863    5756:
15864    TEST624D:
15865            PO,     LOAD-ENUA(ZTARGET403),                  !BIT01 SET
15866                    LOAD-ERROR(TEST624D),                   !ERROR DIRECTORY KEY
15867                    DCS-CTR(C3.),                           !COMPARE AT TARGET
15868            NEXT,   J/GOBUT624D                             !
    (5756)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.010]
15869
15870    5432:  !(FREE)
15871    GOBUT624D:
15872            SETUP,  RETURN/CLEAR624,                        !RETURN TO SCOPE LOOP TEST WORD
15873            NEXT,   GOTO-PAGE(7),                           !BUT TABLE ON PAGE 7
15874                    J/BUTPREFETCHJAM                        !PREFETCH*JAM(1)H IN BIT01
    (5432)  DCS[0.00.0.0.0.0]  BM[0111..00.00..11.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.110.000]
```

```
15875
15876
15877    7165:  !(FREE)
15878    CLEAR624:
15879          SETUP,  RETURN/SCOPE624,                          !RETURN FOR SCOPE LOOP TEST
15880          NEXT,   CALL[CLEAR-I-O-B]                         !CLEAR OUT WHAT I'VE DONE
     (7165)  DCS[0.00.0.0.0.0]  BM[0101..00.01..00.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.011.000]
15881
15882
15883    5224:  !(FREE)
15884    SCOPE624:
15885          P0,     BUMP-VERIFY,                              !COUNT
15886                  BUSDIN+EMIT-[I],                          !RESET PROC UCON
15887                  EN-CLK-IR[15-00],                         !
15888          P3,     BUTA(CUA-TRACK),                          !AND START CUA TRACKING AGAIN
15889          NEXT,   BUTD[SCOPE],                              !NO ERROR:  "TEST701A" [+1. WORDS]
15890                  J/TEST701A                                !   ERROR:  "SETIR624A" [-18. WORDS]
     (5224)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.001...101.110.011]
15891
15892
15893
15894
15895
15896
15897
15898    !.PAGE=============================================================================================================
15899
15900
15901    .TOC   *   TEST701-702:  LOAD/READ THE BA, FULL 18. BITS
15902
15903    !*************************************************************************************************
15904    !*
15905    !*     TESTS:  701A - 702B                                UWORDS:  033 + 042
15906    !*
15907    !*     FUNCTIONS:
15908    !*
15909    !*     THIS NEXT SET OF SIX TESTS CHECKS THE "BA" REGISTER RELATED FUNCTIONS:
15910    !*             SPECIFICALLY,
15911    !*             1) LOAD/READ OF BA<15:00>, FROM BUS-A -> BA -> STATUS-MUX/PBA-PORT
15912    !*             2) BUT ON "BA<00>"
15913    !*             3) LOAD READ OF BA<17:16>, FROM BUS-B -> BA -> STATUS-MUX/SERVICE-PORT
15914    !*                     THE EFFECT OF PARTICULAR KT-UCON-FUNCTIONS/CONSOLE-18.-BIT-MODE
15915    !*                     IN THIS SITUATION IS ALSO EXAMINED FOR FUNCTIONALITY.
15916    !*
15917    !*************************************************************************************************
15918
15919
15920
15921    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
15922
15923    !TEST-701-A CHECKS THAT BA<15:00> CAN BE LOADED, AND READ BACK WITH (052525)
15924    5563:
15925    TEST701A:
15926          P0,     LOAD-ENUA(ZTARGET402),                    !SETUP FOR D=ZERO COMPARE
```

```
15927                   LOAD-ERROR(TEST701A),                   !ERROR DIRECTORY KEY
15928                   DCS-CTR(C12.),                          !COMPARE AT TARGET
15929                   BUMP-VERIFY,                            !COUNT
15930             NEXT, J/MASK701A                              !
    (5563)  DCS[1.00.1.0.0.1]  BM[0011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.110]
15931
15932     5476:
15933     MASK701A:
15934             P3,   CSPD[04]+EMIT, EMIT/177777,             !MASK TO READ ALL THE BITS
15935             NEXT, GOTO-PAGE(7),                           !XFER
15936                   J/EXPEC701A                             !
    (5476)  DCS[0.00.0.0.0.0]  BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.1011...1..0000.0...11.100...001.110.110]
15937
15938     7166:  !(FREE)
15939     EXPEC701A:
15940             P3,   CSPD[02]+EMIT, EMIT/052525,             !EXPECTED DATA TO BE READ OUT OF PBA AFTER LOAD:
15941             NEXT, J/LOADBA701A                            !"0101 0101 0101 0101"
    (7166)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.1101...1..0000.0...11.000...001.111.000]
15942
15943     7170:  !(FREE)
15944     LOADBA701A:
15945             P1,   BA+ASPHI(C052525),                      !LOAD BA<15:00> WITH PATTERN
15946             NEXT, J/GOTEST701A                            !
    (7170)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..111..000...0.0.0..1..0...0.0000...0..0000.0...11.000...001.111.001]
15947
15948     7171:  !(FREE)
15949     GOTEST701A:
15950             SETUP,  RETURN/TEST701B,                      !GO TO SUBR THAT:
15951             NEXT,   CALL[PBATOD]                          !  (PBA)-XOR-CSP(02)->D, BUT(D-IS-ZERO)
    (7171)  DCS[0.00.0.0.0.0]  BM[0101..00.10..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.001]
15952
15953
15954
15955
15956
15957
15958     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
15959
15960     !TEST-701-B CHECKS THAT BA<00> WAS LOADED WITH A (1)
15961     5523:
15962     TEST701B:
15963             P0,   LOAD-ENUA(ZTARGET403),                  !BIT<00> SET
15964                   LOAD-ERROR(TEST701B),                   !ERROR DIRECTORY KEY
15965                   DCS-CTR(C3.),                           !COMPARE AT TARGET
15966             NEXT, J/GOBUT701B                             !
    (5523)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.100]
15967
15968     5434:  !(FREE)
15969     GOBUT701B:
15970             SETUP,  RETURN/TEST701C,                      !RETURN TO START OF NEXT SUBTEST
15971             NEXT,   GOTO-PAGE(7),                         !BUT TABLE
15972                     J/BUTBA00                             !BA<00>H IN BIT<00>
```

```
      (5434)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.001]
15973
15974
15975
15976
15977    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
15978
15979    !TEST-701-C CHECKS THAT BA<15:00> CAN BE LOADED, AND READ BACK WITH (125252)
15980    6770:
15981    TEST701C:
15982            P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
15983                    LOAD-ERROR(TEST701C),                   !ERROR DIRECTORY KEY
15984                    DCS-CTR(C11.),                          !COMPARE AT TARGET
15985            NEXT,   J/EXPEC701C                             !
      (6770)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.101.101]
15986
15987    6455:  !(FREE)
15988    EXPEC701C:
15989            P3,     CSPD[02]+EMIT, EMIT/125252,             !EXPECTED DATA TO BE READ OUT OF PBA AFTER LOAD:
15990            NEXT,   J/LOADBA701C                            !"1010 1010 1010 1010"
      (6455)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..101..010...0.0.0..0..0...0.1101...1..0000.0...11.000...100.101.110]
15991
15992    6456:  !(FREE)
15993    LOADBA701C:
15994            P1,     BA+ASPHI(C125252),                      !LOAD BA<15:00> WITH PATTERN
15995            NEXT,   J/GOTEST701C                            !
      (6456)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..110..000...0.0.0..1..0...0.0000...0..0000.0...11.000...100.101.111]
15996
15997    6457:  !(FREE)
15998    GOTEST701C:
15999            SETUP,  RETURN/TEST701D,                        !GO TO SUBR THAT:
16000            NEXT,   CALL[PBATOD]                            !  (PBA)-XOR-CSP(02)->D, BUT(D-IS-ZERO)
      (6457)  DCS[0.00.0.0.0.0]  BM[0101..00.10..10.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.001]
16001
16002
16003
16004
16005
16006
16007    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16008
16009    !TEST-701-D CHECKS THAT BA<00> WAS LOADED WITH A (0)
16010    5512:
16011    TEST701D:
16012            P0,     LOAD-EMUA(ZTARGET402),                  !BIT<00> CLEAR
16013                    LOAD-ERROR(TEST701D),                   !ERROR DIRECTORY KEY
16014                    DCS-CTR(C3.),                           !COMPARE AT TARGET
16015            NEXT,   J/GOBUT701D                             !
      (5512)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.101]
16016
16017    5435:  !(FREE)
16018    GOBUT701D:
16019            SETUP,  RETURN/SCOPE701,                        !RETURN TO SCOPE LOOP TEST WORD
```

```
16020            NEXT,   GOTO-PAGE(7),                          !BUT TABLE
16021                    J/BUTBA00                              !BA<00>H IN BIT<00>
     (5435)  DCS[0.00.0.0.0.0]  BM[0101..00.10..00.11..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.001]
16022
16023
16024
16025
16026    5436:  !(FREE)
16027    SCOPE701:
16028            PO,     BUMP-VERIFY,                           !COUNT
16029            NEXT,   BUTD[SCOPE],                           !NO ERROR:  "TEST702A" (+1. WORDS)
16030                    J/TEST702A                             !   ERROR:  "MASK701A"  (-12. WORDS)
     (5436)  DCS[0.00.0.1.0.1]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.111]
16031
16032
16033
16034
16035    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16036
16037    !TEST-702-A CHECKS THAT BA<17:16> CAN BE LOADED, AND READ BACK WITH "01"
16038    !  WHEN IN 18. BIT CONSOLE MODE AND KT-NO-RELOCATE MODE
16039    5477:
16040    TEST702A:
16041            PO,     LOAD-ENUA(ZTARGET402),                 !SETUP FOR D=ZERO COMPARE
16042                    LOAD-ERROR(TEST702A),                  !ERROR DIRECTORY KEY
16043                    DCS-CTR(C13.),                         !COMPARE AT TARGET
16044            NEXT,   J/MASK702A                             !
     (5477)  DCS[1.00.1.0.0.0]  BM[0010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.100]
16045
16046    5474:
16047    MASK702A:
16048            P3,     CSPD[04]←EMIT, EMIT/001400,            !MASK TO READ ONLY BITS<9:8>
16049            NEXT,   J/EXPEC702A                            !
     (5474)  DCS[0.00.0.0.0.0]  BM[0000..10.00..11.00..000..000...0.0.0..0..0...0.1011...1..0000.0...11.000...100.011.111]
16050
16051    5437:  !(FREE)
16052    EXPEC702A:
16053            P3,     CSPD[02]←EMIT, EMIT/000400,            !EXPECTED DATA TO BE READ OUT OF SERVICE<9:8> AFTER LOAD:
16054            NEXT,   J/SETLED702A                           !"0000 0001 0000 0000"
     (5437)  DCS[0.00.0.0.0.0]  BM[0000..10.00..01.00..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.100.001]
16055
16056    5441:  !(FREE)
16057    SETLED702A:
16058            P3,     SET-CONSOLE-LED,                       !ENTER INTO 18. BIT MODE FOR PBA<17:16> READ
16059            NEXT,   J/SETKT702A                            !
     (5441)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..100..001...0.0.0..0..0...1.1011...0..0000.0...11.000...100.100.010]
16060
16061    5442:  !(FREE)
16062    SETKT702A:
16063            PO,     BUMP-VERIFY,                           !COUNT
16064                    BUSDIN←SERVICE-[1],                    !READ SERVICE PORT BITS<9:8>
16065                    KT-NO-RELOCATE-[1],                    !SETUP KT FOR BA<17:16> LOADABILITY
16066            NEXT,   J/LOADBA702A                           !
```

```
      (5442)  DCS[0.00.0.0.0.1]  BM[0101..01.00..00.00..000..010...0.0.0..0..0...1.1001...0..0000.0...11.000...10C.100.011]
16067
16068    5443:  !(FREE)
16069    LOADBA702A:
16070           P1,     BA+BSPHI(C052525),                    !LOAD BA<17:16> WITH PATTERN "01"
16071           NEXT,   J/GOTEST702A                          !
      (5443)  DCS[0.00.0.0.0.0]  BM[0000..01.11..00.00..111..000...0.0.0..1..0...0.0000...0..0000.0...11.000...100.100.100]
16072
16073    5444:  !(FREE)
16074    GOTEST702A:
16075           SETUP,  RETURN/TEST702B,                      !GO TO SUBR THAT:
16076           NEXT,   CALL[GETPROCDAT]                      !  (SERVICE<9:8>)-XOR-CSP(02)->D, BUT(D-IS-ZERO)
      (5444)  DCS[0.00.0.0.0.0]  BM[0110..00.11..11.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.111.011]
16077
16078
16079
16080
16081
16082
16083
16084    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16085
16086    !TEST-702-B CHECKS THAT BA<17:16> CAN BE LOADED, AND READ BACK WITH "10"
16087    !  WHEN IN 18. BIT CONSOLE MODE AND KT-NO-RELOCATE MODE
16088    6761:
16089    TEST702B:
16090           P0,     LOAD-EMUA(ZTARGET402),                 !SETUP FOR D=ZERO COMPARE
16091                   LOAD-ERROR(TEST702B),                 !ERROR DIRECTORY KEY
16092                   DCS-CTR(C11.),                        !COMPARE AT TARGET
16093           NEXT,   J/EXPEC702B                           !
      (6761)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.000]
16094
16095    6460:  !(FREE)
16096    EXPEC702B:
16097           P3,     CSPD[02]+EMIT, EMIT/001000,           !EXPECTED DATA TO BE READ OUT OF SERVICE<9:8> AFTER LOAD:
16098           NEXT,   J/SETKT702B                           !"0000 0010 0000 0000"
      (6460)  DCS[0.00.0.0.0.0]  BM[0000..10.00..10.00..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.110.001]
16099
16100    6461:  !(FREE)
16101    SETKT702B:
16102           P0,     BUSDIN+SERVICE-[I],                   !READ SERVICE PORT BITS<9:8>
16103                   KT-NO-RELOCATE-[I],                   !SETUP KT FOR BA<17:16> LOADABILITY
16104           NEXT,   J/LOADBA702B                          !
      (6461)  DCS[0.00.0.0.0.0]  BM[0101..01.00..00.00..000..010...0.0.0..0..0...1.1001...0..0000.0...11.000...100.110.010]
16105
16106    6462:  !(FREE)
16107    LOADBA702B:
16108           P0,     BUMP-VERIFY,                          !COUNT
16109           P1,     BA+BSPHI(C125252),                    !LOAD BA<17:16> WITH PATTERN "10"
16110           NEXT,   J/GOTEST702B                          !
      (6462)  DCS[0.00.0.0.0.1]  BM[0000..01.11..00.00..110..000...0.0.0..1..0...0.0000...0..0000.0...11.000...100.110.011]
16111
16112    6463:  !(FREE)
```

```
16113    GOTEST7029:
16114            SETUP,  RETURN/SCOPE702,                        !GO TO SUBR THAT:
16115            NEXT,   CALL[GETPROCDAT]                        !  (SERVICE<9:8>)-XOR-CSP(02)->D, BUT(D-IS-ZERO)
     (6463)  DCS[0.00.0.0.0.0]  BM[0101..00.10..00.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.111.011]
16116
16117
16118
16119    5433:  !(FREE)
16120    SCOPE702:
16121            P3,     CSPD[04]←EMIT, EMIT/177777,             !RESET MASK FOR SUBSEQUENT TESTS
16122            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST710A"  (+1. WORDS)
16123                    J/TEST710A                              !   ERROR:  "MASK702A"  (-11. WORDS)
     (5433)  DCS[0.00.0.1.0.0]  BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.1011...1..0000.0...11.000...100.111.101]
16124
16125
16126
16127
16128
16129    !.PAGE=============================================================================================================
16130
16131
16132    .TOC   *   TEST710-722:  BUS FUNCTION DECODE, BUS ERROR CONDITIONS
16133
16134    !*************************************************************************************
16135    !*
16136    !*      TESTS:  710A - 722C                                UWORDS:  133 + 274
16137    !*
16138    !*      FUNCTIONS:
16139    !*
16140    !*      WE GET SNEAKY HERE AND TEST THE FULL BUS DECODE/STATUS MUX LOGIC, AND THE BUS  ERROR
16141    !*      CONDITIONS (ODD ADDRESS, INTERNAL ADDRESS, ETC) ALMOST WITHOUT EVER GOING OUT ON THE
16142    !*      BUS (WE DO ONCE, FOR SSYN TIMEOUT).
16143    !*
16144    !*************************************************************************************
16145
16146
16147
16148    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16149
16150    !TESTING 'DATO', 'ODD-ADDRESS' JAMUPP, 18./16. BIT IO-PAGE DECODE
16151
16152    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16153
16154    !TEST-710-A FIRST ATTEMPTS TO DO A BUS "DATO" FUNCTION, TRYING TO FORCE AN "ODD ADDRESS"
16155    !  ABORT/JAMUPP
16156    5475:
16157    TEST710A:
16158            P0,     LOAD-EMUA(4777),                        !JAMUPP ADDRESS
16159                    LOAD-ERROR(TEST710A),                   !ERROR DIRECTORY KEY
16160                    DCS-CTR(C6.),                           !COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
16161            NEXT,   J/LOADRET710A                           !
     (5475)  DCS[1.00.1.0.0.0]  BM[1001..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.010]
16162
```

```
16163    5472:
16164    LOADRET710A:
16165            P3,     CSPD[00]←EMIT, RETURN/TEST710B,          !RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
16166            NEXT,   GOTO-PAGE(4),                            !XFER
16167                    J/LOADADR710A                            !
     (5472)  DCS[0.00.0.0.0.0]  BM[0110..10.11..01.00..100..100...0.0.0..0..0...0.1111...1..0000.0...11.100...011.000.1111]
16168
16169    4307:  !(FREE)
16170    LOADADR710A:
16171            P3,     CSPD[16]←EMIT, EMIT/160001,              !"DIAGNOSTIC" UNIBUS I/O PAGE ADDRESS; ODD BYTE
16172            NEXT,   J/SETJAM710A                             !
     (4307)  DCS[0.00.0.0.0.0]  BM[1110..10.00..00.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...011.001.010]
16173
16174    4312:  !(FREE)
16175    SETJAM710A:
16176            P2-T,   SR←CSPD(D16),                            !SET BIT<00>=(1) FOR JAMUPP EXPECTED
16177            NEXT,   J/BUSFCN710A                             !
     (4312)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0001...0..0000.0...11.000...011.001.011]
16178
16179    4313:  !(FREE)
16180    BUSFCN710A:
16181            P1,     BA←SR, BSPHI(C177777),                   !SET BA<17:00>=(760001), ALTERED TO(160001)
16182                                                             !  SINCE WE'VE LEFT 18. BIT MODE (IN LOADING BA, THAT IS)
16183            P2-T,   D←ZERO,                                  !
16184            P3,     DATO,                                    !DO A BUS "DATO", SHOULD GET ODD ADDRESS ABORTED
16185            NEXT,   J/NEXT710A                               !GO DELAY
     (4313)  DCS[0.00.0.0.0.0]  BM[0011..01.11..00.00..101..000...0.1.0..1..0...1.0010...0..0000.0...11.000...100.100.101]
16186
16187    !** AT THIS POINT JAMUPP SHOULD OCCUR **
16188    !** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
16189    !**  RETURN TO ADDRESS LEFT IN CSP(00) **
16190
16191    !*** END UP HERE IF NO JAMUPP ***
16192    4445:
16193    NEXT710A:
16194            SETUP,  RETURN/TEST710A,                         !FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
16195            NEXT,   GOTO-PAGE(7),                            !  MUST DELAY A FEW MICROWORDS FOR BUS
16196                    J/BUTD-IS-ZERO                           !  ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
     (4445)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
16197
16198
16199    !*** END UP HERE IF JAMUPP ***
16200
16201
16202    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
16203
16204    !TEST-710-B CHECKS THAT THE RIGHT JAM (ODD ADDRESS) IS INDICATED IN THE JAMREG:
16205    !
16206    !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16207    !       FCN:    ODD     0  SSYN YEL  RED  WCS  POW  MEM  SSYN CACH ILL  MGT  RED  ODD  WCS  UBRK
16208    !               ADR        TIME ZON  ZON  PAR  DIS  PAR  TIME  ERR ADR  ABT  ZON  ADR  PAR  TRAP
16209    !       (101004)  1    0    0    0    0    0    1    0    0    0    0    0    0    1    0    0
```

```
16210
16211     6644:
16212     TEST710B:
16213             PO,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16214                     LOAD-ERROR(TEST710B),                   !ERROR DIRECTORY KEY
16215                     DCS-CTR(C10.),                          !COMPARE AT TARGET
16216             NEXT,   J/GOTEST710B                            !
      (6644)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.100]
16217
16218     6464:  !(FREE)
16219     GOTEST710B:
16220             SETUP,  RETURN/TEST710C,                        !GO TO SUBR WHICH:
16221             NEXT,   CALL[ODDJAMTOD]                         !  (JAMREG)-XOR-(101004) -> D, BUT(D=ZERO)  [ODD-ADDRESS]
      (6464)  DCS[0.00.0.0.0.0]  BM[0110..00.11..01.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.100]
16222
16223
16224
16225     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16226
16227     !TEST-710-C CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
16228     !  NOTE PBA<17:16> READ "TRUE" (OUT OF BA) WHEN IN 18. BIT CONSOLE MODE
16229     !
16230     !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16231     !       FCN:    DATI   BG    0  NPR DATOB DATO PBA  PBA  HIB  LOB  TAG  CON  FLT  POW  CACH YEL
16232     !                     SERV       TIME                17   16  ERR  ERR  ERR SERV SERV FAIL   ERR ZON
16233     !       (002340)   0    0    0    0    0    1    0    0    1    1    1    0    0    0    0    0
16234
16235     6645:
16236     TEST710C:
16237             PO,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16238                     LOAD-ERROR(TEST710C),                   !ERROR DIRECTORY KEY
16239                     DCS-CTR(C10.),                          !COMPARE AT TARGET
16240             NEXT,   J/EXPEC710C                             !
      (6645)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.101]
16241
16242     6465:  !(FREE)
16243     EXPEC710C:
16244             P3,     CSPD[02]+EMIT, EMIT/002340,             !DATO(1)H SET, PBA<17:16>="00" IN 18. BIT CONSOLE MODE
16245             NEXT,   J/GOTEST710C                            !  IN SERVICE REG
      (6465)  DCS[0.00.0.0.0.0]  BM[0000..10.01..00.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.110.110]
16246
16247     6466:  !(FREE)
16248     GOTEST710C:
16249             SETUP,  RETURN/TEST710D,                        !GO TO SUBR WHICH:
16250             NEXT,   CALL[SERVICETOD]                        !  (SERVICE)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
      (6466)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.000]
16251
16252
16253
16254     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16255
16256     !TEST-710-D CHECKS THAT PBA<17:16> ARE INDICATED IN SERVICE REG:
```

```
16257     !  NOTE PBA<17:16> READ AS BA<15:13>="111" WHEN IN 16. BIT MODE
16258     !
16259     !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16260     !       FCN:    DATI   BG    0  NPR DATOB DATO PBA  PBA  MIB  LOB  IAG  CON  FLT  POW  CACH YEL
16261     !             SERV     TIME                      17   16  ERR  ERR  ERR SERV SERV FAIL   ERR ZON
16262     !       (003740)  0    0    0    0    0    1    1    1    1    1    1    0    0    0    0    0
16263
16264     6574:
16265     TEST710D:
16266             PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16267                     LOAD-ERROR(TEST710D),                   !ERROR DIRECTORY KEY
16268                     DCS-CTR(C11.),                          !COMPARE AT TARGET
16269             NEXT,   J/EXPEC710D                             !
        (6574)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.111]
16270
16271     6467:  !(FREE)
16272     EXPEC710D:
16273             PO,     BUMP-VERIFY,                            !COUNT
16274             P3,     CSPD[02]←EMIT, EMIT/003740,             !DATO(1)H SET, PBA<17:16>="11" IN 16. BIT MODE
16275             NEXT,   J/CLEAR710D                             !  IN SERVICE REG
        (6467)  DCS[0.00.0.0.0.1]  BM[0000..10.01..11.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.111.000]
16276
16277     6470:  !(FREE)
16278     CLEAR710D:
16279             P3,     CLR-JAM-ERRORS-[I],                     !CLEAR OUT JAM-REG, FOR USE IN NEXT TEST
16280                     CLEAR-CONSOLE-LED,                      !BACK TO 16. BIT MODE
16281             NEXT,   J/GOTEST710D                            !
        (6470)  DCS[0.00.0.0.0.0]  BM[0100..00.00..10.00..010..001...0.0.0..0..0...1.1011...0..0000.0...11.000...100.111.001]
16282
16283     6471:  !(FREE)
16284     GOTEST710D:
16285             SETUP,  RETURN/TEST710E,                        !GO TO SUBR WHICH:
16286             NEXT,   CALL[SERVICET00]                        !  (SERVICE)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
        (6471)  DCS[0.00.0.0.0.0]  BM[0110..00.10..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.000]
16287
16288
16289
16290     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
16291
16292     !TEST-710-E CHECKS THAT THE CLEAR-JAM-ERRORS CLEARED THE JAM REG TO (001000)
16293     6575:
16294     TEST710E:
16295             PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16296                     LOAD-ERROR(TEST710E),                   !ERROR DIRECTORY KEY
16297                     DCS-CTR(C10.),                          !COMPARE AT TARGET
16298             NEXT,   J/GOTEST710E                            !
        (6575)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.010]
16299
16300     6472:  !(FREE)
16301     GOTEST710E:
16302             PO,     BUMP-VERIFY,                            !COUNT
16303             SETUP,  RETURN/SCOPE710,                        !GO TO SUBR WHICH:
16304                                                             !  CSP(02) <- (001000)
```

```
16305                NEXT,    CALL[CLRJAMTOD]                          !  (JAMREG)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
     (6472)  DCS[0.00.0.0.0.1]  BM[0101..00.10..01.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.101]
16306
16307
16308
16309     5445:  !(FREE)
16310     SCOPE710:
16311                P2-U,    IR←EMIT, EMIT/123456,                    !A "CMP-BYTE" INSTR, FOR NEXT TEST SERIES
16312                NEXT,    BUTD[SCOPE],                             !NO ERROR:  "TEST711A"  (+1. WORDS)
16313                         J/TEST711A                               !    ERROR:  "LOADRET710A"  (-17. WORDS)
     (5445)  DCS[0.00.0.1.0.0]  BM[1010..00.01..11.00..101..110...0.0.0..0..0...1.1010...0..0000.0...11.000...100.111.011]
16314
16315
16316
16317
16318
16319
16320     ! - - -
```

```
16352
16353     !*** END UP HERE IF NO JAMUPP ***
16354     4446:
16355     NEXT711A:
16356           SETUP,  RETURN/TEST711A,                        !FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
16357           NEXT,   GOTO-PAGE(7),                           !  MUST DELAY A FEW MICROWORDS FOR BUS
16358                   J/BUTD-IS-ZERO                          !  ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
     (4446)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.11..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
16359
16360
16361     !*** END UP HERE IF JAMUPP ***
16362
16363
16364     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16365
16366     !TEST-711-B CHECKS THAT THE RIGHT JAM (SSYN TIMEOUT) IS INDICATED IN THE JAMREG:
16367     !
16368     !       BIT:     15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16369     !       FCN:    ODD    0  SSYN YEL  RED  WCS  POW  MEM  SSYN CACH ILL  MGT  RED  ODD  WCS  UBRK
16370     !               ADR         TIME ZON  ZON  PAR  DIS  PAR  TIME  ERR ADR  ABT  ZON  ADR  PAR  TRAP
16371     !       (021200) 0    0    1    0    0    0    1    0    1    0    0    0    0    0    0    0
16372
16373     6534:
16374     TEST711B:
16375           PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16376                   LOAD-ERROR(TEST711B),                   !ERROR DIRECTORY KEY
16377                   DCS-CTR(C10.),                          !COMPARE AT TARGET
16378           NEXT,   J/EXPEC711B                             !
     (6534)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.011]
16379
16380     6473:  !(FREE)
16381     EXPEC711B:
16382           PO,     BUMP-VERIFY,                            !COUNT
16383           P3,     CSPD[02]+EMIT, EMIT/021200,             !"SSYN TIMEOUT(1)H" SET
16384           NEXT,   J/GOTEST711B                            !  IN JAMREG
     (6473)  DCS[0.00.0.0.0.1]  BM[0010..10.00..10.10..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.111.100]
16385
16386     6474:  !(FREE)
16387     GOTEST711B:
16388           SETUP,  RETURN/TEST711C,                        !GO TO SUBR WHICH:
16389           NEXT,   CALL[JAMTOD]                            !  (JAMREG)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
     (6474)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.110]
16390
16391
16392
16393     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16394
16395     !TEST-711-C CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
16396     !  BACK IN 16. BIT MODE, SINCE I-O PAGE, PBA<17:16> READ AS "11"
16397     !
16398     !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16399     !       FCN:    DATI   BG    0  NPR DATOB DATO PBA  PBA  HIB  LOB  TAG  CON  FLT  POW  CACH YEL
```

```
16400    !                    SERV      TIME              17   16  ERR  ERR  ERR SERV SERV FAIL   ERR ZON
16401    !      (005740)   0    0    0    0    1    0    1    1    1    1    1    0    0    0    0    0
16402
16403    6530:
16404    TEST711C:
16405            PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16406                    LOAD-ERROR(TEST711C),                   !ERROR DIRECTORY KEY
16407                    DCS-CTR(C11.),                          !COMPARE AT TARGET
16408            NEXT,   J/EXPEC711C                             !
    (6530)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.101]
16409
16410    6475:  !(FREE)
16411    EXPEC711C:
16412            P3,     CSPD[02]+EMIT, EMIT/005740,             !DATOB(1)H SET, PBA<17:16>="11"
16413            NEXT,   J/GOTEST711C                            !  IN SERVICE REG
    (6475)  DCS[0.00.0.0.0.0]  BM[0000..10.10..11.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.111.110]
16414
16415    6476:  !(FREE)
16416    GOTEST711C:
16417            SETUP,  RETURN/TEST711D,                        !GO TO SUBR WHICH:
16418                                                            !  CLR-JAM-ERRORS-[1], FOR NEXT TEST
16419            NEXT,   CALL[CJESERVICETOD]                     !  (SERVICE)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
    (6476)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.111]
16420
16421
16422
16423    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16424
16425    !TEST-711-D CHECKS THAT THE CLEAR-JAM-ERRORS CLEARED THE JAM REG TO (001000)
16426    6526:
16427    TEST711D:
16428            PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16429                    LOAD-ERROR(TEST711D),                   !ERROR DIRECTORY KEY
16430                    DCS-CTR(C10.),                          !COMPARE AT TARGET
16431                    BUMP-VERIFY,                            !COUNT
16432            NEXT,   J/GOTEST711D                            !
    (6526)  DCS[1.00.1.0.0.1]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.111]
16433
16434    6477:  !(FREE)
16435    GOTEST711D:
16436            SETUP,  RETURN/SCOPE711,                        !GO TO SUBR WHICH:
16437                                                            !  CSP(02) <- (001000)
16438            NEXT,   CALL[CLRJAMTOD]                         !  (JAMREG)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
    (6477)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.00..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.101]
16439
16440
16441
16442    5446:  !(FREE)
16443    SCOPE711:
16444            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST712A"  (+1. WORDS)
16445                    J/TEST712A                              !   ERROR:  "LOADRET711A"  (-11. WORDS)
    (5446)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.001]
```

```
16446
16447
16448
16449
16450
16451
16452    ! - - -
```

```
16495                   J/BUTD-IS-ZERO                          ! ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
     (4447)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
16496
16497
16498    !*** END UP HERE IF JAMUPP ***
16499
16500
16501    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16502
16503    !TEST-712-B CHECKS THAT THE RIGHT JAM (INTERNAL ADDRESS) IS INDICATED IN THE JAMREG:
16504    !  FOR THIS JAM, THE JAMREG SHOULD REMAIN CLEAR
16505    !
16506    !       BIT:     15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16507    !       FCN:    000    0  SSYN YEL  RED  WCS  POW  MEM  SSYN CACH ILL  MGT  RED  000  WCS  UBRK
16508    !               ADR         TIME ZON  ZON  PAR  DIS  PAR  TIME  ERR ADR  ABT  ZON  ADR  PAR  TRAP
16509    !       (001000)  0    0    0    0    0    0    1    0    0    0    0    0    0    0    0    0
16510
16511    5505:
16512    TEST712B:
16513            PO,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16514                    LOAD-ERROR(TEST712B),                   !ERROR DIRECTORY KEY
16515                    DCS-CTR(C10.),                          !COMPARE AT TARGET
16516            NEXT,   J/GOTEST712B                            !
     (5505)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.101.000]
16517
16518    5450:  !(FREE)
16519    GOTEST712B:
16520            SETUP,  RETURN/TEST712C,                        !GO TO SUBR WHICH:
16521                                                            !  (001000) -> CSP(02)
16522            NEXT,   CALL[CLRJAMTOD]                         !  (JAMREG)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
     (5450)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.10..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.101]
16523
16524
16525
16526    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16527
16528    !TEST-712-C CHECKS THAT THE "OTHER-JAM-H" SIGNAL IS LOW, INDICATING AN INTERNAL ADDRESS JAM
16529    6524:
16530    TEST712C:
16531            PO,     LOAD-ENUA(ZTARGET401),                  !BIT<01> CLEAR
16532                    LOAD-ERROR(TEST712C),                   !ERROR DIRECTORY KEY
16533                    DCS-CTR(C3.),                           !COMPARE AT TARGET
16534            NEXT,   J/GOBUT712C                             !
     (6524)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.000]
16535
16536    6500:  !(FREE)
16537    GOBUT712C:
16538            SETUP,  RETURN/TEST712D,                        !RETURN TO START OF NEXT SUBTEST
16539            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
16540                    J/BUTOTHERJAM                           !"OTHER JAM H" IN BIT<01>
     (6500)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.010]
```

```
16541
16542
16543
16544     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16545
16546     !TEST-712-D CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
16547     !  BACK IN 16. BIT MODE, SINCE I-O PAGE, PBA<17:16> READ AS "11"
16548     !
16549     !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16550     !       FCN:    DATI   BG    0  NPR DATOB DATO PBA  PBA  HIB  LOB  TAG  CON  FLT  POW  CACH YEL
16551     !                SERV       TIME                  17   16  ERR  ERR  ERR SERV SERV FAIL   ERR ZON
16552     !       (101740)  1    0    0    0    0    0    1    1    1    1    1    0    0    0    0    0
16553
16554     6523:
16555     TEST712D:
16556           P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16557                   LOAD-ERROR(TEST712D),                   !ERROR DIRECTORY KEY
16558                   DCS-CTR(C11.),                          !COMPARE AT TARGET
16559           NEXT,   J/EXPEC712D                             !
     (6523)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.001]
16560
16561     6501:  !(FREE)
16562     EXPEC712D:
16563           P3,     CSP0[02]+EMIT, EMIT/101740,             !DATI(1)H SET, PBA<17:16>="11"
16564           NEXT,   J/GOTEST712D                            !  IN SERVICE REG
     (6501)  DCS[0.00.0.0.0.0]  BM[1000..10.00..11.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.000.010]
16565
16566     6502:  !(FREE)
16567     GOTEST712D:
16568           SETUP,  RETURN/SCOPE712,                        !GO TO SUBR WHICH:
16569                                                           !  CLR-JAM-ERRORS-[I], FOR NEXT TEST
16570           NEXT,   CALL[CJESERVICETOD]                     !  (SERVICE)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
     (6502)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.00..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.111]
16571
16572
16573
16574
16575     5447:  !(FREE)
16576     SCOPE712:
16577           NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST713A"  (+1. WORDS)
16578                   J/TEST713A                              !   ERROR:  "LOADRET712A"  (-12. WORDS)
     (5447)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.111]
16579
16580
16581
16582
16583
16584
16585     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16586
16587     !TESTING 'DATI-NOINT', 'ILLEGAL INTERNAL ADDRESS' JAMUPP
16588
16589     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

```
16590
16591     !TEST-713-A DOES A BUS "DATI-NOINT" FUNCTION TO AN INTERNAL ADDRESS, TRYING TO FORCE
16592     !  AN "ILLEGAL INTERNAL ADDRESS" ABORT/JAMUPP
16593     5467:
16594     TEST713A:
16595           P0,     LOAD-EMUA(4777),                          !JAMUPP ADDRESS
16596                   LOAD-ERROR(TEST713A),                     !ERROR DIRECTORY KEY
16597                   DCS-CTR(C4.),                             !COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
16598                   BUMP-VERIFY,                              !COUNT
16599           NEXT,   J/LOADRET713A                             !
      (5467)  DCS[1.00.1.0.0.1]  BM[1011..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.100]
16600
16601     5464:
16602     LOADRET713A:
16603           P3,     CSPD[00]+EMIT, RETURN/TEST713B,           !RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
16604           NEXT,   GOTO-PAGE(7),                             !XFER
16605                   J/BUSFCN713A                              !
      (5464)  DCS[0.00.0.0.0.0]  BM[0101..10.11..00.01..110..111...0.0.0..0..0...0.1111...1..0000.0...11.100...001.110.111]
16606
16607     7167:  !(FREE)
16608     BUSFCN713A:
16609           P1,     BA+ASPLO(R11),                            !BA=(177776), GENERATED IN PREVIOUS SET OF TESTS
16610           P2-T,   SR+BSPHI(C0000001),                       !SET BIT<00>=(1) FOR JAMUPP EXPECTED
16611           P3,     DATI-NOINT,                               !DO A BUS "DATI-NOINT"
16612                                                             !  SHOULD GET "ILLEGAL INTERNAL ADDR" ABORTED
16613           NEXT,   J/NEXT713A                                !GO DELAY
      (7167)  DCS[0.00.0.0.0.0]  BM[1010..01.11..10.01..000..000...0.0.1..1..0...1.0001...0..0000.0...11.000...011.110.101]
16614
16615     !** AT THIS POINT JAMUPP SHOULD OCCUR **
16616     !** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
16617     !**  RETURN TO ADDRESS LEFT IN CSP(00) **
16618
16619     !*** END UP HERE IF NO JAMUPP ***
16620     7365:
16621     NEXT713A:
16622           SETUP,  RETURN/TEST713A,                          !FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
16623           NEXT,   GOTO-PAGE(7),                             !  MUST DELAY A FEW MICROWORDS FOR BUS
16624                   J/BUTD-IS-ZERO                            !  ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
      (7365)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
16625
16626
16627     !*** END UP HERE IF JAMUPP ***
16628
16629
16630     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
16631
16632     !TEST-713-B CHECKS THAT THE RIGHT JAM (ILLEGAL INTERNAL ADDRESS) IS INDICATED IN THE JAMREG:
16633     !
16634     !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16635     !       FCN:     ODD    0  SSYN YEL  RED  WCS  POW  MEM  SSYN CACH ILL  MGT  RED  ODD  WCS  UBRK
16636     !               ADR       TIME ZON  ZON  PAR  DIS  PAR  TIME  ERR ADR  ABT  ZON  ADR  PAR  TRAP
16637     !     (001040)  0    0    0    0    0    0    1    0    0    0    1    0    0    0    0    0
16638
```

```
16639    5616:
16640    TEST713B:
16641            PD,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16642                    LOAD-ERROR(TEST713B),                   !ERROR DIRECTORY KEY
16643                    DCS-CTR(C10.),                          !COMPARE AT TARGET
16644                    BUMP-VERIFY,                            !COUNT
16645            NEXT,   J/EXPEC713B                             !
     (5616)  DCS[1.00.1.0.0.1]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.101.010]
16646
16647    5452:  !(FREE)
16648    EXPEC713B:
16649            P3,     CSPD[02]+EMIT, EMIT/001040,             !"ILLEGAL INTERNAL ADDRESS(1)H" SET
16650            NEXT,   J/GOTEST713B                            !
     (5452)  DCS[0.00.0.0.0.0]  BM[0000..10.00..10.00..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.101.011]
16651
16652    5453:  !(FREE)
16653    GOTEST713B:
16654            SETUP,  RETURN/TEST713C,                        !GO TO SUBR WHICH:
16655            NEXT,   CALL[JAMTOD]                            !  (JAMREG)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
     (5453)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.110]
16656
16657
16658
16659    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16660
16661    !TEST-713-C CHECKS THAT THE "OTHER-JAM-H" SIGNAL IS HIGH, INDICATING A JAM PRESENT OTHER
16662    !   THAN ONLY A VALID "INTERNAL ADDRESS" JAM
16663    6522:
16664    TEST713C:
16665            PD,     LOAD-EMUA(ZTARGET403),                  !BIT<01> SET
16666                    LOAD-ERROR(TEST713C),                   !ERROR DIRECTORY KEY
16667                    DCS-CTR(C3.),                           !COMPARE AT TARGET
16668            NEXT,   J/GOBUT713C                             !
     (6522)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.011]
16669
16670    6503:  !(FREE)
16671    GOBUT713C:
16672            SETUP,  RETURN/TEST713D,                        !RETURN TO START OF NEXT SUBTEST
16673            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
16674                    J/BUTOTHERJAM                           !"OTHER JAM H" IN BIT<01>
     (6503)  DCS[0.00.0.0.0.0]  BM[0110..00.10..10.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.101.010]
16675
16676
16677
16678    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16679
16680    !TEST-713-D CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
16681    !  BACK IN 16. BIT MODE, SINCE I-O PAGE, PBA<17:16> READ AS "11"
16682    !
16683    !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16684    !       FCN:    DATI   BG    0  NPR DATOB DATO PBA  PBA  HIB  LOB  TAG  CON  FLT  POW  CACH YEL
16685    !                    SERV      TIME                17   16  ERR  ERR  ERR SERV SERV FAIL   ERR ZON
```

```
16686    !      (101740)  1   0   0   0   0   0   1   1   1   1   1   0   0   0   0   0
16687
16688    6521:
16689    TEST713D:
16690            PO,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16691                    LOAD-ERROR(TEST713D),                   !ERROR DIRECTORY KEY
16692                    DCS-CTR(C11.),                          !COMPARE AT TARGET
16693                    BUMP-VERIFY,                            !COUNT
16694            NEXT,   J/EXPEC713D                             !
     (6521)  DCS[1.00.1.0.0.1]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.100]
16695
16696    6504:  !(FREE)
16697    EXPEC713D:
16698            P3,     CSPD[02]+EMIT, EMIT/101740,             !DATI(1)H SET, PBA<17:16>="11"
16699            NEXT,   J/GOTEST713D                            !  IN SERVICE REG
     (6504)  DCS[0.00.0.0.0.0]  BM[1000..10.00..11.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...101.000.101]
16700
16701    6505:  !(FREE)
16702    GOTEST713D:
16703            SETUP,  RETURN/SCOPE713,                        !GO TO SUBR WHICH:
16704                                                            !  CLR-JAM-ERRORS-[I], FOR NEXT TEST
16705            NEXT,   CALL[CJESERVICETOD]                     !  (SERVICE)-XOR-CSP(02) -> D, BUT(D-IS-ZERO)
     (6505)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.111]
16706
16707
16708
16709
16710    5451:  !(FREE)
16711    SCOPE713:
16712            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST720A"  (+1. WORDS)
16713                    J/TEST720A                              !   ERROR:  "LOADRET713A"  (-11. WORDS)
     (5451)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.101]
16714
16715
16716
16717
16718
16719
16720
16721    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16722
16723    !TESTING 'DATIB*-BYTE', 'ODD-ADDRESS' JAMUPP, I/O-PAGE-PBA<17:16> DECODE
16724
16725    !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16726
16727    !TEST-720-A ATTEMPTS TO DO A BUS "DATIB*-BYTE" FUNCTION, TRYING TO FORCE AN "ODD ADDRESS"
16728    !  ABORT/JAMUPP, ALSO CHECKING THAT ALL SERVICE / JAM STATUS BITS SET CORRECTLY
16729    5465:
16730    TEST720A:
16731            PO,     LOAD-EMUA(4777),                        !JAMUPP ADDRESS
16732                    LOAD-ERROR(TEST720A),                   !ERROR DIRECTORY KEY
16733                    DCS-CTR(C7.),                           !COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
16734            NEXT,   J/LOADRET720A                           !
```

```
      (5465)  DCS[1.00.1.0.0.0]  BM[1000..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.010]
16735
16736     5462:
16737     LOADRET720A:
16738           P3,     CSPD[00]←EMIT, RETURN/TEST720B,          !RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
16739           NEXT,   GOTO-PAGE(7),                            !XFER
16740                   J/LOADIR720A                             !
      (5462)  DCS[0.00.0.0.0.0]  BM[0110..10.10..10.10..000..111...0.0.0..0..0...0.1111...1..0000.0...11.100...001.111.010]
16741
16742     7172:  !(FREE)
16743     LOADIR720A:
16744           P2-U,   IR←EMIT, EMIT/000000,                    !"HALT" INSTRUCTION IS -BYTE
16745           NEXT,   J/SETADR720A                             !
      (7172)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...001.111.100]
16746
16747     7174:  !(FREE)
16748     SETADR720A:
16749           P3,     CSPD[16]←EMIT, EMIT/060001,              !BIT<15:13>="011", -IOPAGE; 000-ADDRESS
16750           NEXT,   J/SETJAM720A                             !
      (7174)  DCS[0.00.0.0.0.0]  BM[0110..10.00..00.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...001.111.101]
16751
16752     7175:  !(FREE)
16753     SETJAM720A:
16754           P2-T,   SR←CSPD(D16),                            !SET BIT<00>=(1) FOR JAMUPP EXPECTED
16755           NEXT,   J/BUSFCN720A                             !
      (7175)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0001...0..0000.0...11.000...001.111.110]
16756
16757     7176:  !(FREE)
16758     BUSFCN720A:
16759           P1,     BA←SR,                                   !SET BA<17:00>=(060001)
16760           P3,     DATIB,                                   !DO A BUS "DATIB*-BYTE", SHOULD GET ODD ADDRESS ABORTED
16761           NEXT,   J/NEXT720A                               !GO DELAY
      (7176)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..1..0...1.0011...0..0000.0...11.000...011.110.100]
16762
16763     !** AT THIS POINT JAMUPP SHOULD OCCUR **
16764     !** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
16765     !**  RETURN TO ADDRESS LEFT IN CSP(00) **
16766
16767     !*** END UP HERE IF NO JAMUPP ***
16768     7364:
16769     NEXT720A:
16770           SETUP,  RETURN/TEST720A,                         !FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
16771           NEXT,   GOTO-PAGE(7),                            !  MUST DELAY A FEW MICROWORDS FOR BUS
16772                   J/BUTD-IS-ZERO                           !  ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
      (7364)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
16773
16774
16775     !*** END UP HERE IF JAMUPP ***
16776
16777
16778     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
16779
16780     !TEST-720-B CHECKS THAT THE RIGHT JAM (ODD ADDRESS) IS INDICATED IN THE JAMREG:
```

```
16781    !
16782    !       BIT:     15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16783    !       FCN:    ODD    0 SSYN YEL  RED  WCS  POW  MEM  SSYN CACH ILL  MGT  RED  ODD  WCS  UBRK
16784    !               ADR      TIME ZON  ZON  PAR  DIS  PAR  TIME  ERR ADR  ABT  ZON  ADR  PAR  TRAP
16785    !       (101004)  1    0    0    0    0    0    1    0    0    0    0    0    0    1    0    0
16786
16787    6520:
16788    TEST720B:
16789            PO,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16790                    LOAD-ERROR(TEST720B),                   !ERROR DIRECTORY KEY
16791                    DCS-CTR(C10.),                          !COMPARE AT TARGET
16792                    BUMP-VERIFY,                            !COUNT
16793            NEXT,   J/GOTEST720B                            !
         (6520)  DCS[1.00.1.0.0.1]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...101.000.110]
16794
16795    6506:  !(FREE)
16796    GOTEST720B:
16797            SETUP,  RETURN/TEST720C,                        !GO TO SUBR WHICH:
16798            NEXT,   CALL[ODDJAMTOD]                         !  (JAMREG)-XOR-(101004) -> D, BUT(D=ZERO)  [ODD-ADDRESS]
         (6506)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.100]
16799
16800
16801
16802    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16803
16804    !TEST-720-C CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
16805    !  NOTE:  PBA<17:16> SHOULD NOT BE FORCED TO "11", IN 16. BIT MODE, WHEN BA<15:13>="011"
16806    !
16807    !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16808    !       FCN:    DATI   BG    0  NPR DATOB DATO PBA  PBA  HIB  LOB  TAG  CON  FLT  POW  CACH YEL
16809    !             SERV       TIME                    17   16  ERR  ERR  ERR SERV SERV FAIL   ERR ZON
16810    !       (100340)  1    0    0    0    0    0    0    0    1    1    1    0    0    0    0    0
16811
16812    4760:
16813    TEST720C:
16814            PO,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
16815                    LOAD-ERROR(TEST720C),                   !ERROR DIRECTORY KEY
16816                    DCS-CTR(C11.),                          !COMPARE AT TARGET
16817            NEXT,   J/GOTEST720C                            !
         (4760)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.001.111]
16818
16819    4317:  !(FREE)
16820    GOTEST720C:
16821            SETUP,  RETURN/TEST721A,                        !GO TO SUBR WHICH:
16822                                                            !  CLR-JAM-ERRORS, TO RESET FOR NEXT TEST
16823            NEXT,   CALL[DATISERVICETOD]                    !  (SERVICE)-XOR-(100340) -> D, BUT(D=ZERO)  (DATI[1]H)
         (4317)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.101]
16824
16825
16826
16827
16828
```

```
16829
16830
16831     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16832
16833     !TESTING 'DATOB*-BYTE', 'ODD-ADDRESS' JAMUPP, I/O-PAGE-PBA<17:16> DECODE
16834
16835     !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16836
16837     !TEST-721-A ATTEMPTS TO DO A BUS "DATOB*-BYTE" FUNCTION, TRYING TO FORCE AN "ODD ADDRESS"
16838     !  ABORT/JAMUPP, ALSO CHECKING THAT ALL SERVICE / JAM STATUS BITS SET CORRECTLY
16839     4571:
16840     TEST721A:
16841             PO,     LOAD-ENUA(4777),                                !JAMUPP ADDRESS
16842                     LOAD-ERROR(TEST721A),                           !ERROR DIRECTORY KEY
16843                     DCS-CTR(C6.),                                   !COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
16844             NEXT,   J/LOADRET721A                                   !
        (4571)  DCS[1.00.1.0.0.0]  BM[1001..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.000]
16845
16846     4320:  !(FREE)
16847     LOADRET721A:
16848             P3,     CSPD[00]←EMIT, RETURN/TEST721B,                 !RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
16849             NEXT,   GOTO-PAGE(7),                                   !XFER
16850             NEXT,   J/SETADR721A                                    !
        (4320)  DCS[0.00.0.0.0.0]  BM[0100..10.10..11.11..011..111...0.0.0..0..0...0.1111...1..0000.0...11.100...001.111.011]
16851
16852     7173:  !(FREE)
16853     SETADR721A:
16854             P3,     CSPD[16]←EMIT, EMIT/120001,                     !BIT<15:13>="101", -IOPAGE; ODD-ADDRESS
16855             NEXT,   J/SETJAM721A                                    !
        (7173)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...010.000.000]
16856
16857     7200:  !(FREE)
16858     SETJAM721A:
16859             P2-T,   SR←CSPD(D16),                                   !SET BIT<00>=(1) FOR JAMUPP EXPECTED
16860             NEXT,   J/BUSFCN721A                                    !
        (7200)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0001...0..0000.0...11.000...010.000.001]
16861
16862     7201:  !(FREE)
16863     BUSFCN721A:
16864                                                                     !NOTE:  "IR"=(000000)=-BYTE FROM PREV TEST
16865             P1,     BA←SR,                                          !SET BA<17:00>=(120001)
16866             P3,     DATOB,                                          !DO A BUS "DATOB*-BYTE", SHOULD GET ODD ADDRESS ABORTED
16867             NEXT,   J/NEXT721A                                      !GO DELAY
        (7201)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..1..0...1.0101...0..0000.0...11.000...011.110.010]
16868
16869     !** AT THIS POINT JAMUPP SHOULD OCCUR **
16870     !** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
16871     !**  RETURN TO ADDRESS LEFT IN CSP(00) **
16872
16873     !*** END UP HERE IF NO JAMUPP ***
16874     7362:
16875     NEXT721A:
16876             SETUP,  RETURN/TEST721A,                                !FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
```

```
16877            NEXT,   GOTO-PAGE(7),                          !  MUST DELAY A FEW MICROWORDS FOR BUS
16878                    J/BUTD-IS-ZERO                         !  ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
    (7362)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
16879
16880
16881    !*** END UP HERE IF JAMUPP ***
16882
16883
16884    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
16885
16886    !TEST-721-B CHECKS THAT THE RIGHT JAM (ODD ADDRESS) IS INDICATED IN THE JAMREG:
16887    !
16888    !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16889    !       FCN:    ODD    0  SSYN YEL  RED  WCS  POW  MEM  SSYN CACH ILL  MGT  RED  ODD  WCS  UBRK
16890    !               ADR       TIME ZON  ZON  PAR  DIS  PAR  TIME  ERR ADR  ABT  ZON  ADR  PAR  TRAP
16891    !       (101004)  1    0    0    0    0    0    1    0    0    0    0    0    0    1    0    0
16892
16893    4573:
16894    TEST721B:
16895            PO,     LOAD-ENUA(ZTARGET402),                 !SETUP FOR D=ZERO COMPARE
16896                    LOAD-ERROR(TEST721B),                  !ERROR DIRECTORY KEY
16897                    DCS-CTR(C10.),                         !COMPARE AT TARGET
16898            NEXT,   J/GOTEST721B                           !
    (4573)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.001]
16899
16900    4321:  !(FREE)
16901    GOTEST721B:
16902            SETUP,  RETURN/TEST721C,                       !GO TO SUBR WHICH:
16903            NEXT,   CALL[ODDJAMTOD]                        !  (JAMREG)-XOR-(101004) -> D, BUT(D=ZERO)  [ODD-ADDRESS]
    (4321)  DCS[0.00.0.0.0.0]  BM[0100..00.10..11.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.100]
16904
16905
16906
16907    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
16908
16909    !TEST-721-C CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
16910    !  NOTE:  PBA<17:16> SHOULD NOT BE FORCED TO "11", IN 16. BIT MODE, WHEN BA<15:13>="101"
16911    !
16912    !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16913    !       FCN:    DATI   BG    0  NPR DATOB DATO PBA  PBA  HIB  LOB  TAG  CON  FLT  POW  CACH YEL
16914    !                 SERV      TIME                   17   16  ERR  ERR  ERR SERV SERV FAIL   ERR ZON
16915    !       (002340)   0    0    0    0    0    1    0    0    1    1    1    0    0    0    0    0
16916
16917    4577:
16918    TEST721C:
16919            PO,     LOAD-ENUA(ZTARGET402),                 !SETUP FOR D=ZERO COMPARE
16920                    LOAD-ERROR(TEST721C),                  !ERROR DIRECTORY KEY
16921                    DCS-CTR(C11.),                         !COMPARE AT TARGET
16922            NEXT,   J/GOTEST721C                           !
    (4577)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.010]
16923
16924    4322:  !(FREE)
16925    GOTEST721C:
```

```
16926           SETUP,  RETURN/SCOPE721,                        !GO TO SUBR WHICH:
16927                                                           !  CLR-JAM-ERRORS, TO RESET FOR NEXT TEST
16928           NEXT,   CALL[DATOSERVICETOD]                    !  (SERVICE)-XOR-(002340) -> D, BUT(D=ZERO)  (DATO[1]H)
     (4322)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.110]
16929
16930
16931
16932
16933   5454:  !(FREE)
16934   SCOPE721:
16935           NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST722A"  (+1. WORDS)
16936                   J/TEST722A                              !   ERROR:  "LOADRET720A"  (-24. WORDS)
     (5454)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.110.011]
16937
16938
16939
16940
16941
16942   ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16943
16944   !TESTING 'INVALIDATE', 'ODD-ADDRESS' JAMUPP, I/O-PAGE-PBA<17:16> DECODE
16945
16946   !  - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
16947
16948   !TEST-722-A ATTEMPTS TO DO A BUS "INVALIDATE" FUNCTION, TRYING TO FORCE AN "ODD ADDRESS"
16949   !  ABORT/JAMUPP, ALSO CHECKING THAT ALL SERVICE / JAM STATUS BITS SET CORRECTLY
16950   5463:
16951   TEST722A:
16952           P0,     LOAD-ENUA(4777),                        !JAMUPP ADDRESS
16953                   LOAD-ERROR(TEST722A),                   !ERROR DIRECTORY KEY
16954                   DCS-CTR(C6.),                           !COMPARE JUST AFTER BUS CYCLE UWORD, AT JAM
16955           NEXT,   J/LOADRET722A                           !
     (5463)  DCS[1.00.1.0.0.0]  BM[1001..00.10..01.11..111..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.101.110]
16956
16957   5456:  !(FREE)
16958   LOADRET722A:
16959           P3,     CSPD[00]+EMIT, RETURN/TEST722B,         !RETURN AFTER SUCCESSFUL JAM TO NEXT TEST
16960           NEXT,   GOTO-PAGE(4),                           !XFER
16961           NEXT,   J/SETADR722A                            !
     (5456)  DCS[0.00.0.0.0.0]  BM[0100..10.10..01.10..100..100...0.0.0..0..0...0.1111...1..0000.0...11.100...100.111.000]
16962
16963   4470:
16964   SETADR722A:
16965           P3,     CSPD[16]+EMIT, EMIT/140001,             !BIT<15:13>="110", -IOPAGE; ODD-ADDRESS
16966           NEXT,   J/SETJAM722A                            !
     (4470)  DCS[0.00.0.0.0.0]  BM[1100..10.00..00.00..000..001...0.0.0..0..0...0.0001...1..0000.0...11.000...011.010.011]
16967
16968   4323:  !(FREE)
16969   SETJAM722A:
16970           P2-T,   SR+CSPD(D16),                           !SET BIT<00>=(1) FOR JAMUPP EXPECTED
16971           NEXT,   J/BUSFCN722A                            !
     (4323)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.0001...0..0000.0...11.000...011.010.100]
```

```
16972
16973     4324:  !(FREE)
16974     BUSFCN722A:
16975               P1,     BA←SR,                                  !SET BA<17:00>=(140001)
16976               P3,     INVALIDATE,                             !DO A BUS "INVALIDATE", SHOULD GET ODD ADDRESS ABORTED
16977               NEXT,   J/NEXT722A                              !GO DELAY
     (4324)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..1..0...1.0111...0..0000.0...11.000...101.010.100]
16978
16979     !** AT THIS POINT JAMUPP SHOULD OCCUR **
16980     !** CLASSIC FLOW (4777) -> (4757) -> (7XXX) -> (4XXX), AND THEN WE'RE BACK HERE **
16981     !**  RETURN TO ADDRESS LEFT IN CSP(00) **
16982
16983     !*** END UP HERE IF NO JAMUPP ***
16984     4524:
16985     NEXT722A:
16986               SETUP,  RETURN/TEST722A,                        !FORCE A SCOPE LOOP ON THIS TEST, BUT FIRST
16987               NEXT,   GOTO-PAGE(7),                           !  MUST DELAY A FEW MICROWORDS FOR BUS
16988                       J/BUTD-IS-ZERO                          !  ERROR TO TAKE EFFECT  (IGNORE "BUT" OUTCOME HERE)
     (4524)  DCS[0.00.0.0.0.0]  BM[0101..00.10..01.10..011..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
16989
16990
16991     !*** END UP HERE IF JAMUPP ***
16992
16993
16994     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
16995
16996     !TEST-722-B CHECKS THAT THE RIGHT JAM (ODD ADDRESS) IS INDICATED IN THE JAMREG:
16997     !
16998     !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
16999     !       FCN:     ODD    0  SSYN YEL  RED  WCS  POW  MEM  SSYN CACH ILL  MGT  RED  ODD  WCS  UBRK
17000     !               ADR        TIME ZON  ZON  PAR  DIS  PAR  TIME  ERR ADR  ABT  ZON  ADR  PAR  TRAP
17001     !       (101004)  1    0    0    0    0    0    1    0    0    0    0    0    0    1    0    0
17002
17003     4464:
17004     TEST722B:
17005               P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
17006                       LOAD-ERROR(TEST722B),                   !ERROR DIRECTORY KEY
17007                       DCS-CTR(C11.),                          !COMPARE AT TARGET
17008                       BUMP-VERIFY,                            !COUNT
17009               NEXT,   J/GOTEST722B                            !
     (4464)  DCS[1.00.1.0.0.1]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.101]
17010
17011     4325:  !(FREE)
17012     GOTEST722B:
17013               SETUP,  RETURN/TEST722C,                        !GO TO SUBR WHICH:
17014               NEXT,   CALL[ODDJAMTOD]                         !  (JAMREG)-XOR-(101004) -> D, BUT(D=ZERO)  [ODD-ADDRESS]
     (4325)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.10..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.100]
17015
17016
17017
17018     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
17019
```

```
17020     !TEST-722-C CHECKS THAT THE RIGHT BUS FUNCTION DECODE / PBA<17:16> ARE INDICATED IN SERVICE REG:
17021     !  NOTE:  PBA<17:16> SHOULD NOT BE FORCED TO "11", IN 16. BIT MODE, WHEN BA<15:13>="110"
17022     !
17023     !       BIT:      15   14   13   12   11   10   09   08   07   06   05   04   03   02   01   00
17024     !       FCN:    DATI   BG    0  NPR DATOB DATO PBA  PBA  HIB  LOB  TAG  CON  FLT  POW  CACH YEL
17025     !                 SERV       TIME                 17   16  ERR  ERR  ERR SERV SERV FAIL   ERR ZON
17026     !       (002340)   0    0    0    0    0    1    0    0    1    1    1    0    0    0    0    0
17027
17028     4465:
17029     TEST722C:
17030             PO,     LOAD-EMUA(ZTARGET402),                          !SETUP FOR D=ZERO COMPARE
17031                     LOAD-ERROR(TEST722C),                           !ERROR DIRECTORY KEY
17032                     DCS-CTR(C11.),                                  !COMPARE AT TARGET
17033             NEXT,   J/GOTEST722C                                    !
      (4465)  DCS[1.00.1.0.0.0]  BM[0100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.110]
17034
17035     4326:  !(FREE)
17036     GOTEST722C:
17037             SETUP,  RETURN/SCOPE722,                                !GO TO SUBR WHICH:
17038                                                                     !  CLR-JAM-ERRORS, TO RESET FOR NEXT TEST
17039             NEXT,   CALL[DATOSERVICETOD]                            !  (SERVICE)-XOR-(002340) -> D, BUT(D=ZERO)  (DATO[1]H)
      (4326)  DCS[0.00.0.0.0.0]  BM[0100..00.01..10.10..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.110]
17040
17041
17042
17043
17044     4327:  !(FREE)
17045     SCOPE722:
17046             NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "TEST730A"  (+1. WORDS)
17047                     J/TEST730A                                      !   ERROR:  "SETADR720A"  (-11. WORDS)
      (4327)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...100.111.001]
17048
17049
17050
17051
17052
17053     !.PAGE=============================================================================================================
17054
17055
17056     .TOC   *   TEST730-731:  BUS CYCLES TO/FROM MEMORY
17057
17058     !*************************************************************************************************
17059     !*
17060     !*      TESTS:  730A - 731E                                     UWORDS:  063 + 057
17061     !*
17062     !*      FUNCTIONS:
17063     !*
17064     !*      THESE TESTS CHECK THAT ACTUAL BUS CYCLES CAN BE CORRECTLY EXECUTED.
17065     !*
17066     !*************************************************************************************************
17067
17068
17069
```

```
17070
17071
17072
17073     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17074
17075     !THIS FIRST SERIES OF TESTS DOES A DATO/DATIP/DATO/DATIB SEQUENCE, CHECKING THAT
17076     !EACH FUNCTION OPERATES AS EXPECTED.
17077
17078     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17079
17080     !TEST-730-A DOES A DATO, AND THEN CHECKS THAT THE DBUF LATCH (DS) ALSO GETS LOADED WITH THE
17081     !  DATA, AND THAT IT IS ENABLED ON BUSDIN IN THE MICROWORD AFTER THE BUS CYCLE (IE, EMIT
17082     !  IS TEMPORARILY DISABLED)
17083     4471:
17084     TEST730A:
17085             P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
17086                     LOAD-ERROR(TEST730A),                   !ERROR DIRECTORY KEY
17087                     DCS-CTR(C9.),                           !COMPARE AT TARGET
17088             NEXT,   J/LOADIR730A                            !
     (4471)  DCS[1.00.1.0.0.0]  BM[0110..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...111.101.100]
17089
17090     4754:
17091     LOADIR730A:
17092             P2-U,   IR←EMIT, EMIT/125200,                   !"CMP-BYTE" INSTR; INSTR5-E88(412) DECODE
17093             NEXT,   J/LOADDATA730A                          !
     (4754)  DCS[0.00.0.0.0.0]  BM[1010..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.011.000]
17094
17095     4330:  !(FREE)
17096     LOADDATA730A:
17097             P3,     CSPD[16]←EMIT, EMIT/125252,             !PATTERN (125252) IN BASCON AREA
17098             NEXT,   J/BUSFCN730A                            !
     (4330)  DCS[0.00.0.0.0.0]  BM[1010..10.10..10.10..101..010...0.0.0..0..0...0.0001...1..0000.0...11.000...011.011.001]
17099
17100     4331:  !(FREE)
17101     BUSFCN730A:
17102             P0,     BUMP-VERIFY,                            !COUNT
17103             P1,     BA←ASPHI(C000000),                      !USE MEMORY ADDR(000000)
17104             P2-T,   D←CSPB(B16), D[C]←0,                    !USE DATA (125252)
17105             P3,     DATO,                                   !FOR A BUS "DATO" CYCLE
17106             NEXT,   J/GETDBUF730A                           !
     (4331)  DCS[0.00.0.0.0.1]  BM[1010..11.01..11.01..100..000...0.1.0..1..0...1.0010...0..0000.0...11.000...011.011.010]
17107
17108     4332:  !(FREE)
17109     GETDBUF730A:
17110             P0,     BUMP-VERIFY,                            !COUNT
17111             P3,     CSPD[17]←BUSDIN, EMIT/037777,           !DBUF SHOULD BE ENABLED; EMIT IS NOISE
17112             P3-T,   D←JUNK, SAVE-D[C],                      !MANGLE DATA IN D, DONT CARE WHAT RESULTS
17113             NEXT,   J/COMP730A                              !
     (4332)  DCS[0.00.0.0.0.1]  BM[0011..10.11..11.11..111..111...1.1.0..0..0...0.0000...1..0000.0...11.000...011.011.011]
17114
17115     4333:  !(FREE)
17116     COMP730A:
17117             P0,     BUMP-VERIFY,                            !COUNT
17118             P2-T,   D←CSPD[17]-XOR-ASPHI(C125252),           !COMPARE RECEIVED:EXPECTED
```

```
17119                   NEXT,   J/ZAPDBUF730A                                   !
     (4333)  DCS[0.00.0.0.0.1]  BM[0110..10.00..11.01..110..000...0.1.0..0..0...0 0000...0..0000.0...11.000...011.011.100]
17120
17121      4334:  !(FREE)
17122      ZAPDBUF730A:
17123                   P3,     DBUF←D-[1],                                     !COPY ZEROED(?) D-REG INTO DBUF
17124                   NEXT,   J/GOBUT730A                                     !
     (4334)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...011.011.101]
17125
17126      4335:  !(FREE)
17127      GOBUT730A:
17128                   SETUP,  RETURN/TEST730B,                                !RETURN TO START OF NEXT SUBTEST
17129                   NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
17130                           J/BUTD-IS-ZERO                                  !CHECK FOR EQUALITY
     (4335)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.10..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
17131
17132
17133
17134
17135
17136
17137
17138      !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
17139
17140      !TEST-730-B DOES A DATIP, AND THEN CHECKS THAT:
17141      !   1) NO ODD ADDRESS ERROR RESULTS
17142      !   2) THE RIGHT DATA (OUTPUT ABOVE) IS RETRIEVED  (NOTE DBUF LATCH WAS ZEROED
17143      !      TO ALTER ITS COPY OF THE DATA)
17144      !   3) THE BUS HOLDING FUNCTION OF THE 'DATIP' SHOULD BE EMPLOYED; 'BBSY' SHOULD REMAIN ASSERTED
17145      !      WELL PAST THE 'NORMAL' 1 MICROWORD AFTER THE BUS CYCLE.  IN FACT, IT SHOULD REMAIN ASSERTED
17146      !      (HOLDING BUSDIN=UNIBUS-DATA-BUFFER, NOT EMIT, ETC) UNTIL CLEARED BY ANOTHER BUS CYCLE
17147      !      (NOT A DATIP), OR A BUTA(LAST) [DONE HERE].
17148      4466:
17149      TEST730B:
17150                   P0,     LOAD-EMUA(ZTARGET402),                          !SETUP FOR D=ZERO COMPARE
17151                           LOAD-ERROR(TEST730B),                           !ERROR DIRECTORY KEY
17152                           DCS-CTR(C7.),                                   !COMPARE AT TARGET
17153                   NEXT,   J/EXPEC730B                                     !
     (4466)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.110]
17154
17155      4336:  !(FREE)
17156      EXPEC730B:
17157                   P3,     CSPD[02]←EMIT, EMIT/000340,                     !SERVICE PORT BITS FOR A "DATIP"
17158                   NEXT,   J/BUSFCN730B                                    !
     (4336)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...011.011.111]
17159
17160      4337:  !(FREE)
17161      BUSFCN730B:
17162                   P1,     BA←ASPHI(C000001),                              !USE MEMORY ADDR(000001), ODD BYTE
17163                   P2-T,   D←ZERO, D[C]←ALU15,                             !ZAP D
17164                   P3,     DATIP,                                          !FOR A BUS "DATIP" CYCLE
17165                           BUTA(CLR-FLAG-RES-UCON),                        !RESET BUSDIN TO EMIT/ZAP DBUF←D UCON
17166                   NEXT,   J/GETIT730B                                     !
```

```
      (4337)  DCS[0.00.0.0.0.0]  BM[0011..00.00..11.01..000..100...0.1.0..1..0...1.0100...0..0000.0...11.010...011.100.000]
17167
17168     4340:  !(FREE)
17169     GETIT730B:
17170            PD,     BUMP-VERIFY,                          !COUNT
17171            P3,     CSPD[17]←BUSDIN, EMIT/052525,         !UNIBUS DATA SHOULD BE ENABLED; EMIT IS NOISE
17172            NEXT,   J/GOBUT730B                           !
      (4340)  DCS[0.00.0.0.0.1]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.0000...1..0000.0...11.000...011.100.001]
17173
17174     4341:  !(FREE)
17175     GOBUT730B:
17176            SETUP,  RETURN/TEST730C,                      !EXEC SUBR WHICH:
17177            NEXT,   CALL[CSP17XOR125252]                  !  CSP(17)-XOR-(125252) -> D, BUT(D=ZERO)
      (4341)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.10..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.000.011]
17178
17179
17180
17181
17182
17183     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17184
17185     !TEST-730-C NOW CHECKS THAT THE 'DATIP' FUNCTION IS STILL HOLDING THE BUS BY
17186     !  VERIFYING THAT THE UNIBUS DATA BUFFER IS STILL ENABLED ON BUSDIN, DATA=(125252)
17187     4460:
17188     TEST730C:
17189            PD,     LOAD-EMUA(ZTARGET402),                !SETUP FOR D=ZERO COMPARE
17190                    LOAD-ERROR(TEST730C),                 !ERROR DIRECTORY KEY
17191                    DCS-CTR(C5.),                         !COMPARE AT TARGET
17192                    BUMP-VERIFY,                          !COUNT
17193            NEXT,   J/GOBUT730C                           !
      (4460)  DCS[1.00.1.0.0.1]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.010]
17194
17195     4342:  !(FREE)
17196     GOBUT730C:
17197            SETUP,  RETURN/TEST730C1,                     !EXEC SUBR WHICH:
17198                                                          !  1) BUSDIN -> CSP(17), EMIT=(052525)
17199            NEXT,   CALL[BUSDINXOR125252]                 !  2) CSP(17)-XOR-(125252) -> D, BUT(D=ZERO)
      (4342)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...001.111.111]
17200
17201
17202
17203
17204
17205     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17206
17207     !TEST-730-C1 NOW CHECKS THAT THE 'DATIP' FUNCTION WILL RELEASE THE BUS BY
17208     !  VERIFYING THAT THE UNIBUS DATA BUFFER IS NOT ENABLED ON BUSDIN, DATA=(125252),
17209     !  AFTER ISSUING BUTA(LAST), WHICH SHOULD CLEAR THE DATIP/BBSY FLOP
17210     4450:
17211     TEST730C1:
17212            PD,     LOAD-EMUA(ZTARGET402),                !SETUP FOR D=ZERO COMPARE
17213                    LOAD-ERROR(TEST730C1),                !ERROR DIRECTORY KEY
```

```
17214                   DCS-CTR(C5.),                           !COMPARE AT TARGET
17215           P3,     BUTA(LAST),                             !ACTIVE BUT EFFECT:  CLEAR OUT DATIP
17216           NEXT,   J/GOBUT730C1                            !
    (4450)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...10.000...100.100.011]
17217
17218     4443:
17219     GOBUT730C1:
17220           SETUP,  RETURN/TEST730D,                        !EXEC SUBR WHICH:
17221                                                           !  1) BUSDIN -> CSP(17), EMIT=(052525)
17222           NEXT,   CALL[BUSDINXOR052525]                   !  2) CSP(17)-XOR-(052525) -> D, BUT(D=ZERO)
    (4443)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.000.100]
17223
17224
17225
17226
17227     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17228
17229     !TEST-730-D DOES A DATO FOLLOWED BY A DATIB*BYTE*ODD, AND THEN CHECKS THAT THE RIGHT DATA
17230     !  IS WRITTEN/RETRIEVED FROM MEMORY LOCATIONS (000000)/(000001)
17231     !  AND THAT THE EMIT-DISABLE/UNIBUS DATA BUFFER ENABLE IS HANDLED CORRECTLY
17232     4461:
17233     TEST730D:
17234           P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
17235                   LOAD-ERROR(TEST730D),                   !ERROR DIRECTORY KEY
17236                   DCS-CTR(C15.),                          !HOLD UP FOR NOW
17237           NEXT,   J/LOADDATA730D                          !
    (4461)  DCS[1.00.1.0.0.0]  BM[0000..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.011]
17238
17239     4343:  !(FREE)
17240     LOADDATA730D:
17241           P3,     CSPD[16]+EMIT, EMIT/052525,             !PATTERN (052525) IN BASCON AREA
17242           NEXT,   J/SETZER730D                            !
    (4343)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.0001...1..0000.0...11.000...011.100.100]
17243
17244     4344:  !(FREE)
17245     SETZER730D:
17246           P1,     BA+ASPHI(C000000),                      !USE MEMORY ADDR(000000)
17247           P2-T,   D+CSPB(B16), D[C]+0,                    !USE DATA (052525)
17248           P3,     DATO,                                   !FOR A BUS "DATO" CYCLE
17249           NEXT,   J/MANGLED730D                           !
    (4344)  DCS[0.00.0.0.0.0]  BM[1010..11.01..11.01..100..000...0.1.0..1..0...1.0010...0..0000.0...11.000...011.100.101]
17250
17251     4345:  !(FREE)
17252     MANGLED730D:
17253           P3-T,   D+ASPHI(C125252), SAVE-D[C],            !MANGLE D CONTENTS, AFTER/AT P3-T
17254           NEXT,   J/BUSFCN730D                            !
    (4345)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..110..111...1.1.0..0..0...0.0000...0..0000.0...11.000...011.100.110]
17255
17256     4346:  !(FREE)
17257     BUSFCN730D:
17258           P0,     BUMP-VERIFY,                            !COUNT
17259                   DCS-CTR(C12.),                          !COMPARE AT TARGET
17260           P1,     BA+ASPHI(C000001),                      !ADDRESS ODD BYTE
```

```
17261            P3,     DATIB,                                  !BYTE READ -> PLAIN DATI; NO ODD ADDRESS ERROR
17262            NEXT,   J/GETIT730D                             !
     (4346)  DCS[0.00.1.0.0.1]  BM[0011..00.00..11.01..000..000...0.0.0..1..0...1.0011...0..0000.0...11.000...011.100.111]
17263
17264    4347:  !(FREE)
17265    GETIT730D:
17266            P3,     CSPD[17]+BUSDIN, EMIT/000001),          !UNIBUS DATA SHOULD BE ENABLED; EMIT IS NOISE
17267            NEXT,   J/GOBUT730D                             !
     (4347)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...011.101.000]
17268
17269    4350:  !(FREE)
17270    GOBUT730D:
17271            SETUP,  RETURN/TEST730E,                        !GO TO SUBR WHICH:
17272            NEXT,   CALL[CLRSERVICE!0D]                     !  (SERVICE)-XOR-(000340) -> D, BUT(D=ZERO)
     (4350)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.10..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.100]
17273
17274
17275
17276
17277
17278
17279
17280    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17281
17282
17283    !TEST-730-E NOW CHECKS THAT THE BUS FUNCTION ABOVE ACTUALLY RETRIEVED THE RIGHT DATA:
17284    !  THE (052525) WRITTEN TO MEMORY LOCATION (000000) IN TEST730D
17285    4462:
17286    TEST730E:
17287            P0,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
17288                    LOAD-ERROR(TEST730E),                   !ERROR DIRECTORY KEY
17289                    DCS-CTR(C4.),                           !COMPARE AT TARGET
17290            NEXT,   J/GOBUT730E                             !
     (4462)  DCS[1.00.1.0.0.0]  BM[1011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.101.001]
17291
17292    4351:  !(FREE)
17293    GOBUT730E:
17294            SETUP,  RETURN/SCOPE730,                        !EXEC SUBR WHICH:
17295            NEXT,   CALL[CSP17XOR052525]                    !  CSP(17)-XOR-(052525) -> D, BUT(D=ZERO)
     (4351)  DCS[0.00.0.0.0.0]  BM[0100..00.01..11.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.000.101]
17296
17297
17298    4352:  !(FREE)
17299    SCOPE730:
17300            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST731A"  (+1. WORDS)
17301                    J/TEST731A                              !   ERROR:  "LOADIR730A"  (-24. WORDS)
     (4352)  DCS[0.00.0.1.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.101.101]
17302
17303
17304
17305
17306
```

```
17307
17308
17309
17310     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17311
17312     !THIS SECOND SERIES OF TESTS DOES A DATOB/DATI/DATI-CLKIR SEQUENCE, CHECKING THAT
17313     !EACH FUNCTION OPERATES AS EXPECTED.
17314
17315     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17316
17317     !TEST-731-A DOES A DATOB*BYTE*ODD, AND THEN CHECKS THAT THE DBUF LATCH (DS) ALSO GETS LOADED WITH THE
17318     !  DATA, AND THAT IT IS ENABLED ON BUSDIN IN THE MICROWORD AFTER THE BUS CYCLE (IE, EMIT
17319     !  IS TEMPORARILY DISABLED)
17320     4755:
17321     TEST731A:
17322             PD,     LOAD-ENUA(ZTARGET402),                  !SETUP FOR D=ZERO COMPARE
17323                     LOAD-ERROR(TEST731A),                   !ERROR DIRECTORY KEY
17324                     DCS-CTR(C6.),                           !COMPARE AT TARGET
17325             NEXT,   J/BUSFCN731A                            !
     (4755)  DCS[1.00.1.0.0.0]  BM[1001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...111.110.100]
17326
17327     4764:
17328     BUSFCN731A:
17329             P1,     BA←ASPHI(C000001),                      !USE MEMORY ADDR(000001), ODD BYTE
17330             P2-T,   D←ZERO, D[C]←ALU15,                     !USE DATA (ODD), ONE BYTE (ODD) ONLY
17331             P3,     DATOB,                                  !FOR A BUS "DATOB*BYTE*ODD" CYCLE
17332             NEXT,   J/GETDBUF731A                           !
     (4764)  DCS[0.00.0.0.0.0]  BM[0011..00.00..11.01..000..100...0.1.0..1..0...1.0101...0..0000.0...11.000...011.101.011]
17333
17334     4353:  !(FREE)
17335     GETDBUF731A:
17336             PD,     BUMP-VERIFY,                            !COUNT
17337             P3,     CSPD[17]←BUSDIN,                        !DBUF SHOULD BE ENABLED; EMIT IS NOISE
17338             P3-T,   D←ASPHI(C177777), SAVE-D[C],            !MANGLE DATA IN D, DONT CARE WHAT RESULTS
17339             NEXT,   J/COMP731A                              !
     (4353)  DCS[0.00.0.0.0.1]  BM[1111..10.00..11.01..101..111...1.1.0..0..0...0.0000...1..0000.0...11.000...011.101.100]
17340
17341     4354:  !(FREE)
17342     COMP731A:
17343             P2-T,   D←CSPD(D17), SAVE-D[C],                 !COMPARE RECEIVED:(000000)
17344             NEXT,   J/GOBUT731A                             !
     (4354)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...011.101.101]
17345
17346     4355:  !(FREE)
17347     GOBUT731A:
17348             SETUP,  RETURN/TEST731B,                        !RETURN TO START OF NEXT SUBTEST
17349             NEXT,   GOTO-PAGE(7),                           !BUT TABLE
17350                     J/BUTD-IS-ZERO                          !CHECK FOR EQUALITY
     (4355)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.01..111..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
17351
17352
17353
17354
```

```
17355
17356
17357
17358    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17359
17360    !TEST-731-B NOW CHECKS THAT NONE OF THE ABOVE BUS FUNCTIONS HAS ALTERED THE IR FROM WHEN
17361    !  IT WAS LOADED IN TEST730A, WITH THE VALUE (125200), INSTR5-E88(412) DECODE
17362    4457:
17363    TEST731B:
17364            PO,     LOAD-EMUA(ZTARGET412),                  !SETUP FOR INSTR5/E88 DECODE
17365                    LOAD-ERROR(TEST731B),                   !ERROR DIRECTORY KEY
17366                    DCS-CTR(CS.),                           !COMPARE AT TARGET
17367            NEXT,   J/BUSFCN731B                            !
     (4457)  DCS[1.00.1.0.0.0]  BM[1010..00.11..11.00..001..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.101.110]
17368
17369    4356:  !(FREE)
17370    BUSFCN731B:
17371            P1,     BA+ASPHI(C000000),                      !USE MEMORY ADDR(000000)
17372            P3,     DATI,                                   !FOR A BUS "DATI" CYCLE
17373            NEXT,   J/GETIT731B                             !
     (4356)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..100..000...0.0.0..1..0...1.0110...0..0000.0...11.000...011.101.111]
17374
17375    4357:  !(FREE)
17376    GETIT731B:
17377            PO,     BUMP-VERIFY,                            !COUNT
17378            P3,     CSPD[17]+BUSDIN, EMIT/152500,           !UNIBUS DATA SHOULD BE ENABLED; EMIT IS NOISE
17379            NEXT,   J/GOBUT731B                             !  THIS DATA IS INSTR5-E88(405) DECODE
     (4357)  DCS[0.00.0.0.0.1]  BM[1101..10.01..01.01..000..000...0.0.0..0..0...0.0000...1..0000.0...11.000...011.110.000]
17380
17381    4360:  !(FREE)
17382    GOBUT731B:
17383            SETUP,  RETURN/TEST731C,                        !RETURN TO START OF NEXT SUBTEST
17384            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
17385                    J/BUTINSTRS                             !CHECK THAT IR STILL HAS DATA (125200)
     (4360)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.01..110..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
17386
17387
17388
17389
17390
17391
17392
17393    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17394
17395
17396    !TEST-731-C NOW CHECKS THAT THE BUS FUNCTION ABOVE ACTUALLY RETRIEVED THE RIGHT DATA:
17397    !  THE (052525) WRITTEN TO MEMORY LOCATION (001)/(000) IN TEST730D
17398    !  AND THE (000) WRITTEN TO MEMORY LOCATION (001) IN TEST731A
17399    !  TOGETHER THESE FORM A (000125) IN MEMORY LOCATION (001)#(000):  INSTR5-E78(432) DECODE
17400    4456:
17401    TEST731C:
17402            PO,     LOAD-EMUA(ZTARGET432),                  !SETUP FOR INSTR5-E78(432) DECODE
17403                    LOAD-ERROR(TEST731C),                   !ERROR DIRECTORY KEY
```

```
17404                   DCS-CTR(C7.),                                   !COMPARE AT TARGET
17405                   BUMP-VERIFY,                                    !COUNT
17406           NEXT,   J/COMP731C                                      !
     (4456)  DCS[1.00.1.0.0.1]  BM[1000..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.0011]
17407
17408    4361:  !(FREE)
17409    COMP731C:
17410           P2-I,   D+CSPD(D17), D[C]+0,                            !GET DATA READ FROM DATI, ABOVE
17411           NEXT,   J/GOBUT731C                                     !
     (4361)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0000...0..0000.0...11.000...011.110.0010]
17412
17413    4362:  !(FREE)
17414    GOBUT731C:
17415           SETUP,  RETURN/TEST731D,                                !RETURN TO START OF NEXT SUBTEST
17416           NEXT,   CALL[DINTOIR-5]                                 !SUBR FOR:  D -> IR, BUT(INSTR5)
     (4362)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.01..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.111.0111]
17417
17418
17419
17420
17421
17422    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17423
17424    !TEST-731-D DOES A DATI-CLKIR, AND THEN CHECKS THAT THE RIGHT DATA
17425    !  IS WRITTEN/RETRIEVED FROM MEMORY LOCATIONS (000000)/(000001)
17426    !  AND THAT THE EMIT-DISABLE/UNIBUS DATA BUFFER ENABLE IS HANDLED CORRECTLY
17427    4455:
17428    TEST731D:
17429           P0,     LOAD-EMUA(ZTARGET402),                          !SETUP FOR D=ZERO COMPARE
17430                   LOAD-ERROR(TEST731D),                           !ERROR DIRECTORY KEY
17431                   DCS-CTR(C14.),                                  !COMPARE AT TARGET
17432           NEXT,   J/LOADIR731D                                    !
     (4455)  DCS[1.00.1.0.0.0]  BM[0001..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.0011]
17433
17434    4363:  !(FREE)
17435    LOADIR731D:
17436           P2-U,   IR+EMIT, EMIT/125200,                           !PREV DATA IN IR FOR INSTR5-E88(412)
17437           NEXT,   J/BUSFCN731D                                    !
     (4363)  DCS[0.00.0.0.0.0]  BM[1010..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.110.1001]
17438
17439    4364:  !(FREE)
17440    BUSFCN731D:
17441           P1,     BA+ASPHI(C000000),                              !FROM LOCATION (000000)
17442           P3,     DATI-CLKIR,                                     !DO A DATI, AND CLKIR
17443           NEXT,   J/MANGLED731D                                   !
     (4364)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..100..000...0.0.0..1..0...1.0000...0..0000.0...11.000...011.110.1010]
17444
17445    4365:  !(FREE)
17446    MANGLED731D:
17447           P2-U,   !IR+DATA,                                       !IR SHOULD GET DATA HERE
17448                   EMIT/152500,                                    !NOISE ON EMIT:  INSTR5-E88(405)
17449           NEXT,   J/GOBUT731D                                     !
     (4365)  DCS[0.00.0.0.0.0]  BM[1101..00.01..01.01..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.1100]
```

```
17450
17451    4366:  !(FREE)
17452    GOBUT731D:
17453           SETUP,  RETURN/TEST731E,                        !GO TO SUBR WHICH:
17454           NEXT,   CALL[CLRSERVICE]OD]                     !  (SERVICE)-XOR-(000340) -> D, BUT(D=ZERO)
     (4366)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.01..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.100]
17455
17456
17457
17458
17459
17460
17461
17462    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17463
17464
17465    !TEST-731-E NOW CHECKS THAT THE BUS FUNCTION ABOVE ACTUALLY RETRIEVED THE RIGHT DATA:
17466    4454:
17467    TEST731E:
17468           P0,     LOAD-EMUA(ZTARGET432),                  !SETUP FOR INSTR5-E78(432) DECODE
17469                   LOAD-ERROR(TEST731E),                   !ERROR DIRECTORY KEY
17470                   DCS-CTR(C3.),                           !COMPARE AT TARGET
17471           NEXT,   J/GOBUT731E                             !
     (4454)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..011..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.110.111]
17472
17473    4367:  !(FREE)
17474    GOBUT731E:
17475           SETUP,  RETURN/SCOPE731,                        !RETURN TO SCOPE LOOP TEST WORD
17476           NEXT,   GOTO-PAGE(7),                           !BUT TABLE
17477                   J/BUTINSTR5                             !CHECK FOR RIGHT DATA
     (4367)  DCS[0.00.0.0.0.0]  BM[0100..00.01..11.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.001]
17478
17479
17480    4370:  !(FREE)
17481    SCOPE731:
17482           P2-U,   IR←EMIT, EMIT/125200,                   !RESET IR FOR SCOPE LOOP
17483           NEXT,   BUTD[SCOPE],                            !NO ERROR:  "LOADIR740A"  (+5. WORDS)
17484                   J/LOADIR740A                            !   ERROR:  "BUSFCN731A"  (-18. WORDS)
     (4370)  DCS[0.00.0.1.0.0]  BM[1010..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...111.110.101]
17485
17486
17487    !      -       -       -       -       -       -       -       -       -       -       -       -
17488
17489    !      THESE SUBROUTINES ARE USED IN THE PREVIOUS TESTS:
17490
17491    7177:  !(FREE)
17492    BDX12:
17493           P3,     CSPD[17]←BUSDIN, EMIT/052525,           !ENTRY FOR "BUSDINXOR125252"
17494           NEXT,   J/C17X12                                !
     (7177)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.0000...1..0000.0...11.000...010.000.011]
17495
17496    7203:  !(FREE)
```

```
17497    C17X12:
17498            P2-T,   D←CSPD[17]-XOR-ASPHI(C125252),          !ENTRY FOR "CSP17XOR125252"
17499                    SAVE-D[C],                              !
17500            NEXT,   J/BUTD-IS-ZERO                          !FINISH OUT BY TESTING RESULT OF COMPARISON
    (7203)  DCS[0.00.0.0.0.0]  BM[0110..10.00..11.01..110..111...0.1.0..0..0...0.0000...0..0000.0...11.000...011.100.001]
17501
17502
17503    7204:  !(FREE)
17504    BOX05:
17505            P3,     CSPD[17]←BUSDIN, EMIT/052525,           !ENTRY FOR "BUSDINXOR052525"
17506            NEXT,   J/C17X05                                !
    (7204)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.0000...1..0000.0...11.000...010.000.101]
17507
17508    7205:  !(FREE)
17509    C17X05:
17510            P2-T,   D←CSPD[17]-XOR-ASPHI(C052525),          !ENTRY FOR "CSP17XOR052525"
17511                    SAVE-D[C],                              !
17512            NEXT,   J/BUTD-IS-ZERO                          !FINISH OUT BY TESTING RESULT OF COMPARISON
    (7205)  DCS[0.00.0.0.0.0]  BM[0110..10.00..11.01..111..111...0.1.0..0..0...0.0000...0..0000.0...11.000...011.100.001]
17513
17514
17515    !      -       -       -       -       -       -       -       -       -       -       -       -
17516
17517
17518
17519
17520    !.PAGE=========================================================================================================
17521
17522
17523    .TOC   *   TEST740:  BUS CYCLE MODIFICATION - PREFETCH ALTERATION, OVERLAP YANK
17524
17525    !*************************************************************************************************
17526    !*
17527    !*      TESTS:  740A - 740D                                     UWORDS:  020 + 043
17528    !*
17529    !*      FUNCTIONS:
17530    !*
17531    !*      THESE FOUR TESTS CHECK THAT LOGIC CONCERNED WITH:
17532    !*
17533    !*              1) BCO/PREFETCH = BCO[1] * NOT(PREFETCH*BUT[INSTR1])
17534    !*                      IE, ALTER BUS CODE (**1) -> (**0), IN A PREFETCH SITUATION
17535    !*
17536    !*      AND     2) BEGIN-DATA-XFER = BEGIN[BUS/UCON] * NOT(PULSE-SUPPRESS[0]) * NOT(INH-SPLO)
17537    !*                      IE, 'YANK' [STOP] A BUS CYCLE IN A NON-OVERLAP SITUATION
17538    !*
17539    !*************************************************************************************************
17540
17541
17542
17543
17544
17545
17546    !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
17547
```

```
17548    !TEST-740-A CHECKS THAT BC[0]-H DOES NOT GET ALTERED FROM (1) -> (0) WHEN:
17549    !  BUTA[INSTR1]-H IS ASSERTED, BUT PREFETCH-H IS NEGATED
17550    4765:
17551    LOADIR740A:
17552            P2-U,   IR←EMIT, EMIT/056000,                    !(OVERLAP,-PREFETCH), (-BYTE,DOP,-SMO)
17553            NEXT,   J/TEST740A                               !
     (4765)  DCS[0.00.0.0.0.0]  BM[0101..00.11..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...111.100.100]
17554
17555    4744:
17556    TEST740A:
17557            P0,     LOAD-EMUA(ZTARGET402),                   !SETUP FOR D=ZERO COMPARE
17558                    LOAD-ERROR(TEST740A),                    !ERROR DIRECTORY KEY
17559                    DCS-CTR(C12.),                           !COMPARE AT TARGET
17560            NEXT,   J/BUSFCN740A                             !
     (4744)  DCS[1.00.1.0.0.0]  BM[0011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.001]
17561
17562    4371:  !(FREE)
17563    BUSFCN740A:
17564            P0,     BUMP-VERIFY,                             !COUNT
17565            P1,     BA←ASPHI(C000000),                       !USE MEMORY ADDR (000000)
17566            P2-T,   SR←ZERO,                                 !SR<00>=(0), FOR UNEXPECTED JAMUPPS
17567            P3,     DATIB,                                   !CODE=(3)/DATIB, POSSIBLY ALTERED TO (2)/DATO
17568                    BUTA(INSTR-1),                           !ACTIVE EFFECT ONLY - BRANCH MASKED
17569            NEXT,   J/GOBUT740A                              !(056000) TARGETS TO (316), MASKED UNDER (776)
     (4371)  DCS[0.00.0.0.0.1]  BM[0011..00.00..11.01..100..000...0.0.1..1..0...1.0011...0..0000.0...00.110...111.111.110]
17570
17571    4776:
17572    GOBUT740A:
17573            SETUP,  RETURN/LOADIR740B,                       !GO TO SUBR WHICH:
17574                                                             !  CLR-JAM-ERRORS, FOR INSURANCE
17575            NEXT,   CALL[DATISERVICETOD]                     !  (SERVICE)-XOR-(100340) -> D, BUT(D=ZERO)
     (4776)  DCS[0.00.0.0.0.0]  BM[0100..00.01..11.11..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.101]
17576
17577
17578
17579
17580
17581    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17582
17583    !TEST-740-B CHECKS THAT BC[0]-H DOES GET ALTERED FROM (1) -> (0) WHEN:
17584    !  BUTA[INSTR1]-H IS ASSERTED, AND PREFETCH-H IS ASSERTED
17585    4372:  !(FREE)
17586    LOADIR740B:
17587            P2-U,   IR←EMIT, EMIT/020606,                    !(OVERLAP,PREFETCH), (-BYTE,DOP,SMO)
17588            NEXT,   J/TEST740B                               !
     (4372)  DCS[0.00.0.0.0.0]  BM[0010..00.00..01.10..000..110...0.0.0..0..0...1.1010...0..0000.0...11.000...100.101.011]
17589
17590    4453:
17591    TEST740B:
17592            P0,     LOAD-EMUA(ZTARGET402),                   !SETUP FOR D=ZERO COMPARE
17593                    LOAD-ERROR(TEST740B),                    !ERROR DIRECTORY KEY
17594                    DCS-CTR(C12.),                           !COMPARE AT TARGET
17595            NEXT,   J/BUSFCN740B                             !
```

```
      (4453)  DCS[1.00.1.0.0.0]  BM[0011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.011]
17596
17597    4373:  !(FREE)
17598    BUSFCN740B:
17599           P1,     BA+ASPHI(C000000),                    !USE MEMORY ADDR (000000)
17600           P3,     DATIB,                                !CODE=(3)/DATIB, POSSIBLY ALTERED TO (2)/DATO
17601                   BUTA(INSTR-1),                        !ACTIVE EFFECT ONLY - BRANCH MASKED
17602           NEXT,   J/GOBUT740B                           !(020606) TARGETS TO (042), MASKED UNDER (766)
      (4373)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..100..000...0.0.0..1..0...1.0011...0..0000.0...00.110...111.110.110]
17603
17604    4766:
17605    GOBUT740B:
17606           SETUP,  RETURN/TEST740C,                      !GO TO SUBR WHICH:
17607                                                         !  CLR-JAM-ERRORS, FOR INSURANCE
17608           NEXT,   CALL[DATOSERVICETOD]                  !  (SERVICE)-XOR-(002340) -> D, BUT(D=ZERO)
      (4766)  DCS[0.00.0.0.0.0]  BM[0100..00.10..01.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.110]
17609
17610
17611
17612
17613
17614    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17615
17616    !TEST-740-C CHECKS THAT BC[0]-H DOES NOT GET ALTERED FROM (1) -> (0) WHEN:
17617    !  BUTA[INSTR1]-H IS NEGATED, BUT PREFETCH-H IS ASSERTED
17618    4452:
17619    TEST740C:
17620           P0,     LOAD-EMUA(ZTARGET402),                 !SETUP FOR D=ZERO COMPARE
17621                   LOAD-ERROR(TEST740C),                 !ERROR DIRECTORY KEY
17622                   DCS-CTR(C12.),                        !COMPARE AT TARGET
17623                   BUMP-VERIFY,                          !COUNT
17624           NEXT,   J/BUSFCN740C                          !IR AS ABOVE:  (OVERLAP,PREFETCH), (-BYTE,DOP,SMO)
      (4452)  DCS[1.00.1.0.0.1]  BM[0011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.111.100]
17625
17626    4374:  !(FREE)
17627    BUSFCN740C:
17628           P1,     BA+ASPHI(C000000),                    !USE MEMORY ADDR (000000)
17629           P3,     DATIB,                                !CODE=(3)/DATIB, POSSIBLY ALTERED TO (2)/DATO
17630           NEXT,   J/GOBUT740C                           !(020606) TARGETS TO (042), MASKED UNDER (766)
      (4374)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..100..000...0.0.0..1..0...1.0011...0..0000.0...11.000...011.111.101]
17631
17632    4375:  !(FREE)
17633    GOBUT740C:
17634           SETUP,  RETURN/LOADIR740D,                    !GO TO SUBR WHICH:
17635                                                         !  CLR-JAM-ERRORS, FOR INSURANCE
17636           NEXT,   CALL[DATISERVICETOD]                  !  (SERVICE)-XOR-(100340) -> D, BUT(D=ZERO)
      (4375)  DCS[0.00.0.0.0.0]  BM[0100..00.10..00.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.100.101]
17637
17638
17639
17640
17641
```

```
17642    ! - - -
```

```
17690    !*
17691    !*     TESTS:  761A - 763D                                  UWORDS: 060 + 045
17692    !*
17693    !*     FUNCTIONS:      TESTS 761A - 763D CAUSE AN INTERRUPT ON THE UNIBUS AT
17694    !*                       LEVEL BR6, USING THE DL11-W LINE CLOCK AS A GENERATOR,
17695    !*                       THEN TEST TO SEE THAT ALL THE APPROPRIATE BELLS AND
17696    !*                       WHISTLES AND PARAPHERNALEAXJAISQQURE ALSO RESPOND.
17697    !*
17698    !*****************************************************************************
17699
17700
17701
17702
17703
17704
17705    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17706
17707    !THIS FIRST SET OF THREE TESTS CLEAR OUT ALL THE I-O UCON REGISTERS:
17708    !CLR-JAM-ERRORS, CLR-YELLOW-ZONE, CLEAR-CONSOLE-SERVICE, CLR-NPR-TIMEOUT, CLR-PWR-FAIL, AND
17709    !ALSO THIS TIME DO AN "INIT" ON THE UNIBUS, VIA THE BUS-INIT-UCON FUNCTION.
17710    !ALSO SET ALL THE FLAGS<8:0>H=ZERO, AND THE FULL PS<15:00>H=ZERO,
17711    !(IE, PROCESSOR PRIO=0, T-BIT=0).
17712    !
17713    !THEN CHECK TO SEE THAT ALL THE RELEVANT BUS CONTROL INTERRUPT LOGIC IS RESET.
17714
17715
17716
17717
17718
17719    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17720
17721    !TEST 761A CHECKS THAT SERVICE-H=NOT(INTR-HIGH-H*FLAG7(0)H*BG-SERVICE(0)H) IS LOW,
17722    !  WHEN INTR-HIGH-H=HIGH, FLAG7(0)H=HIGH, AND BG-SERVICE(0)H=HIGH
17723    !  IE, AFTER UNIBUS-INIT, AND CLEAR SERVICE CONDITIONS, W/ PSW PRIO=000,
17724    !  THERE SHOULD BE NOTHING PENDING
17725    4745:
17726    TEST761A:
17727            PO,     LOAD-ENUA(ZTARGET402),                  !BIT<00> CLEAR
17728                    LOAD-ERROR(TEST761A),                   !ERROR DIRECTORY KEY
17729                    DCS-CTR(C12.),                          !COMPARE AT TARGET
17730            P3,     BUTA(CLR-FLAG-RES-UCON),                !SET SR/LOAD, BUSDIN/EMIT
17731            NEXT,   J/ZERODSR761A                           !
    (4745)  DCS[1.00.1.0.0.0]  BM[0011..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.010...111.111.010]
17732
17733    4772:
17734    ZERODSR761A:
17735            P2-T,   D←ZERO, SR←ZERO, D[C]←ALU15,            !ZERO FOR FLAGS/PS/JAMUPP FLAG
17736            NEXT,   J/ZEROIT761A                            !
    (4772)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..100...0.1.1..0..0...0.0000...0..0000.0...11.000...100.000.011]
17737
17738    4403:  !(FREE)
17739    ZEROIT761A:
17740            PO,     BUMP-VERIFY,                            !COUNT
17741                    BUSDIN←EMIT-[I],                        !KEEP IT ON
```

```
                P3,     FLAG[8-0]←0[15-8]-[1],                  !ZERO THE FLAGS
                PS←0-[1],                                       !ZERO ALL OF THE PS
                NEXT,   J/CLEAR761A                             !
     (4403)  DCS[0.00.0.0.0.1]  BM[1000..00.00..00.01..010..011...0.0.0..0..0...1.1011...0..0000.0...11.000...100.000.100]

     4404:  !(FREE)
     CLEAR761A:
                SETUP,  RETURN/GOBUT761A,                       !GO TO SUBR WHICH DOES THE CLEARS AND BUS-INIT
                NEXT,   CALL[CLEAR-I-O-A]                       !
     (4404)  DCS[0.00.0.0.0.0]  BM[0100..00.10..00.00..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.010.111]

     4405:  !(FREE)
     GOBUT761A:
                SETUP,  RETURN/TEST761B,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                        J/BUTSERVICE                            !SERVICE-H IN BIT<00>
     (4405)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.11..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.101]

     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

     !TEST 761B CHECKS THAT VECTOR-LOAD[1]H=-(UNIBUS-INTR-L) IS LOW
     4771:
     TEST761B:
                PO,     LOAD-ENUA(ZTARGET401),                  !BIT<01> CLEAR
                        LOAD-ERROR(TEST761B),                   !ERROR DIRECTORY KEY
                        DCS-CTR(C3.),                           !COMPARE AT TARGET
                        BUMP-VERIFY,                            !COUNT
                NEXT,   J/GOBUT761B                             !
     (4771)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.110]

     4406:  !(FREE)
     GOBUT761B:
                SETUP,  RETURN/TEST761C,                        !RETURN TO START OF NEXT SUBTEST
                NEXT,   GOTO-PAGE(7),                           !BUT TABLE
                        J/BUTVECTLOAD                           !VECTOR-LOAD[1]H IN BIT<01>
     (4406)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.11..100..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.110]

     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

     !TEST 761C CHECKS THAT BG-SERVICE(0)H=BR>PS-L IS HIGH WHEN NO DEVICES REQUEST INTR ON UNIBUS
     4774:
     TEST761C:
                PO,     LOAD-ENUA(ZTARGET407),                  !BIT<02> SET  (ACTIVE LOW)
```

```
17788                   LOAD-ERROR(TEST761C),                   !ERROR DIRECTORY KEY
17789                   DCS-CTR(C3.),                           !COMPARE AT TARGET
17790           NEXT,   J/GOBUT761C                             !
     (4774)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.000.111]
17791
17792     4407:  !(FREE)
17793     GOBUT761C:
17794           SETUP,  RETURN/SCOPE761,                        !RETURN TO SCOPE LOOP TEST WORD
17795           NEXT,   GOTO-PAGE(7),                           !BUT TABLE
17796                   J/BUTBGSERVL                            !BG-SERVICE[0]H IN BIT<02>
     (4407)  DCS[0.00.0.0.0.0]  BM[0100..00.10..00.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.110]
17797
17798
17799
17800     4410:  !(FREE)
17801     SCOPE761:
17802           P0,     BUMP-VERIFY,                            !COUNT
17803           P3,     CSPD[05]+EMIT, EMIT/177546,             !(177546) IS UNIBUS ADDR OF CSR FOR DL11-W
17804           NEXT,   BUTD[SCOPE],                            !NO ERROR:  "TEST762A" (+1. WORDS)
17805                   J/TEST762A                              !   ERROR:  "ZERODSR761A"  (-8. WORDS)
     (4410)  DCS[0.00.0.1.0.1]  BM[1111..10.11..11.01..100..110...0.0.0..0..0...0.1010...1..0000.0...11.000...111.111.011]
17806
17807
17808
17809
17810
17811     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17812
17813     !THE FOLLOWING FIVE TESTS NOW CAUSE AN INTERRUPT ON THE UNIBUS, AND THEN
17814     !CHECK THAT THE BUS CONTROL LOGIC RESPONDS CORRECTLY.
17815     !FIRST THE LINE CLOCK INTR ENABLE BIT<06> IS SET, AND THE PROCESSOR PRIORITY IS SET TO (6).
17816     !SINCE THE DL11-W IS A BR6 DEVICE, THE INTERRUPT SHOULD NOT COME THRU UNTIL THE PRIORITY IS
17817     !LOWERED TO LEVEL (5) OR LOWER.  NOTE THAT THE MICROCODE MUST GO IN TO A WAIT LOOP FOR A
17818     !MINIMUM OF 16.7 MILLISEC @ 60 HZ, OR 20 MILLISEC @ 50 HZ TO GUARANTEE THAT AN INTERRUPT WILL
17819     !BE PENDING.  THE DELAY, BASED UPON  UP3-UP3 = 170 NS, WILL BE 22.3 MILLISEC; AN ADEQUATE MARGIN.
17820
17821
17822
17823
17824
17825     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17826
17827     !TEST 762A ENABLES THE INTERRUPT, THEN WAITS FOR THE DELAY PERIOD.
17828     4773:
17829     TEST762A:
17830           P0,     LOAD-EMUA(ZAPD762A),                    !COMPARE JUST AFTER BUS CYCLE INVOKED
17831                   LOAD-ERROR(TEST762A),                   !ERROR DIRECTORY KEY
17832                   DCS-CTR(C5.),                           !COMPARE JUST AFTER "DATO" INITIATED, BELOW
17833           NEXT,   J/DW11L762A                             !
     (4773)  DCS[1.00.1.0.0.0]  BM[1010..00.10..00.11..001..101...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.001]
17834
17835     4411:  !(FREE)
17836     DW11L762A:
```

```
17837            P2-T,   SR+CSPD(D05),                          !GET SR=(177546), ADDR OF DL11-W CSR
17838            NEXT,   GOTO-PAGE(7),                          !XFER
17839                    J/MASK762A                             !
     (4411)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..111...0.0.1..0..0...0.1010...0..0000.0...11.100...010.000.010]
17840
17841    7202:  !(FREE)
17842    MASK762A:
17843            P3,     CSPD[04]+EMIT, EMIT/177777,            !READ ALL BITS IN REGISTERS READ
17844            NEXT,   J/PRI06762A                            !
     (7202)  DCS[0.00.0.0.0.0]  BM[1111..10.11..11.11..111..111...0.0.0..0..0...0.1011...1..0000.0...11.000...010.000.111]
17845
17846    7207:  !(FREE)
17847    PRI06762A:
17848            P3,     CSPD[15]+EMIT,                         !EMITCON FOR:  PS<7:5>="110"=(6), T-BIT=0
17849                    EMIT/000300,                           !  AND BIT<06> SET FOR DL11-W INTR ENABLE
17850            NEXT,   J/GETIT762A                            !
     (7207)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.11..000..000...0.0.0..0..0...0.0010...1..0000.0...11.000...010.001.000]
17851
17852    7210:  !(FREE)
17853    GETIT762A:
17854            P1,     BA+SR,                                 !BA <- (177546), BITS<17:16> FORCED TO "11" ON IO-PAGE ADDRESS
17855            P2-T,   D+CSPB(B15),                           !(000300) INTO D  ** NOTE:  BIT<1:0> = 00 FOR BA LOAD **
17856            P3,     DATO,                                  !WRITE IT OUT
17857            NEXT,   GOTO-PAGE(4),                          !XFER FOR DCS XTN BITS
17858                    J/ZAPD762A                             !
     (7210)  DCS[0.00.0.0.0.0]  BM[1010..11.10..00.00..000..100...0.1.0..1..0...1.0010...0..0000.0...11.100...011.001.101]
17859
17860    4315:  !(FREE)
17861    ZAPD762A:
17862            P3-T,   D+ZERO, D[C]+ALU15,                    !ZERO D, D[C] FOR LOOP; MUST DO AFTER P3-T
17863            NEXT,   J/NEXTD762A                            !ENTER AT 2ND WORD OF LOOP; LET D SETTLE
     (4315)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..100...1.1.0..0..0...0.0000...0..0000.0...11.000...100.110.111]
17864
17865    !***   THE FOLLOWING TWO WORDS NOW GO INTO A COUNT LOOP TO WAIT FOR THE LINE CLOCK TO INTERRUPT
17866    !***   THE WAIT WILL BE A MAXIMUM DELAY, DEPENDING UPON THE PROCESSOR UP3-UP3 CYCLE TIME:
17867    !***
17868    !***            PROCESSOR       TIME DELAY
17869    !***            CYCLE TIME      (MILLISEC)
17870    !***            (NANOSEC)
17871    !***            ----------      ----------
17872    !***               150             19.7
17873    !***               160             21.0
17874    !***             * 170 *         * 22.3 *       <NOMINAL VALUE>
17875    !***               180             23.6
17876    !***               190             24.9
17877    !***
17878    !***   NOTE THAT THE ABOVE LOOP TIME IS A MAXIMUM VALUE; WE WILL EXIT EARLY IF THE INTERRUPT COMES
17879    !***   THROUGH BEFORE WE OVERFLOW THE COUNTER.  IF NO INTERRUPT COMES THROUGH BY THE TIME THE COUNT
17880    !***   HAS OVERFLOWN, IT WILL BE CONSIDERED AN ERROR.
17881    !***
17882
17883    !* ENTER HERE FOR ANOTHER LOOP *
```

```
17884    4551:
17885    BUMPD762A:
17886          P3-T,   D←D-PLUS-1, D[C]←COUT15,                !BUMP D, SAVE CARRYOUT
17887          NEXT,   BUTR(BG-SERVCE-L),                      !NEGATED:  "NEXTD762A"
17888                  J/SETPR6-762A                           !ASSERTED: "SETPR6-762A"
     (4551)  DCS[0.00.0.0.0.0]  BM[1001..01.11..01.01..000..110...1.1.0..0..0...0.0000...0..0000.0...01.100...100.110.011]
17889
17890    4467:
17891    NEXTD762A:
17892          P0,     DCS-CTR(C15.),                          !STALL; NOTE: NO BUMP-VERIFIES IN THIS LOOP
17893          NEXT,   BUTR(D[C]-8),                           !SET:    "TEST762A1"  D OVERFLOWN, ERROR
17894                  J/BUMPD762A                             !CLEAR:  "BUMPD762A"  GO FOR NEXT LOOP
     (4467)  DCS[0.00.1.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.011...101.101.001]
17895
17896
17897    !* COME HERE IF D OVERFLOWN *
17898    4553:
17899    TEST762A1:
17900          P0,     LOAD-ERROR(TEST762A1),                  !ERROR DIRECTORY KEY
17901                  DCS-CTR(C0.),                           !SIGNAL ERROR NOW
17902          NEXT,   J/TEST762A                              !FORCE A SCOPE LOOP
     (4553)  DCS[1.00.1.0.0.0]  BM[1111..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...111.111.011]
17903
17904
17905    !*** COME HERE IF EXIT LOOP OK:  D NOT OVERFLOWED, INTERRUPT PENDING ***
17906    4463:
17907    SETPR6-762A:
17908          P2-T,   D←CSPD(D15), D[C]←0,                    !GET D<7:5>=(6), D<4>=(0)
17909          NEXT,   J/SETPRI762A                            !
     (4463)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.1.0..0..0...0.0010...0..0000.0...11.000...100.001.011]
17910
17911    4413:  !(FREE)
17912    SETPRI762A:
17913          P0,     BUSDIN←EMIT-[I],                        !KEEP IT ON
17914          P2,     PS[3-0]←D[3-0]-[I],                     !FOR USE IN TEST763A, PS[CC]="0000" HERE
17915          P3,     PS[7-4]←D[7-4]-[I],                     !PRIO=6, T-BIT=0
17916          NEXT,   J/TEST762B                              !NOTE:  THE BR6 PENDING INTR SHOULD NOW HIDE UNDER PROCESSOR PRIO(6)
     (4413)  DCS[0.00.0.0.0.0]  BM[1000..00.00..00.01..010..000...0.0.0..0..0...1.1011...0..0000.0...11.000...111.101.001]
17917
17918
17919    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17920
17921    !TEST 762B CHECKS THAT BG-SERVICE(0)H=BR>PS-L IS HIGH WHEN THE PROCESSOR PRIORITY(=6) IS AS HIGH
17922    !AS THE ONLY DEVICE WISHING TO REQUEST AN INTERRUPT (AT BR6).
17923    4751:
17924    TEST762B:
17925          P0,     LOAD-ENUA(ZTARGET407),                  !BIT<02> SET  (ACTIVE LOW)
17926                  LOAD-ERROR(TEST762B),                   !ERROR DIRECTORY KEY
17927                  DCS-CTR(C3.),                           !COMPARE AT TARGET
17928                  BUMP-VERIFY,                            !
17929          NEXT,   J/GOBUT762B                             !
     (4751)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...111.110.010]
17930
17931    4762:
```

```
17932    GOBUT762B:
17933            SETUP,  RETURN/TEST762C,                        !RETURN TO START OF NEXT SUBTEST
17934            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
17935                    J/BUTBGSERVL                            !BG-SERVICE[0]H IN BIT<02>
     (4762)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.110]
17936
17937
17938
17939
17940
17941    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17942
17943    !TEST 762C CHECKS THAT BG-SERVICE[0]H=BR>PS-L IS LOW WHEN A BR6 DEVICE (DL11-W) IS REQUESTING AN INTR,
17944    !AND THE PROCESSOR PRIORITY(=5) IS < THE BR LEVEL(=6).  NO OTHER DEVICES PRESENT.
17945    4740:
17946    TEST762C:
17947            P0,     LOAD-ENUA(ZTARGET403),                  !BIT<02> CLEAR  (ACTIVE LOW)
17948                    LOAD-ERROR(TEST762C),                   !ERROR DIRECTORY KEY
17949                    DCS-CTR(C7.),                           !COMPARE AT TARGET
17950            NEXT,   J/FILL762C                              !
     (4740)  DCS[1.00.1.0.0.0]  BM[1000..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.100]
17951
17952    4414:  !(FREE)
17953    FILL762C:
17954            P2-T,   D←ASPHI(C125252), D[C]←ALU00,           !BIT<7:5>="101"=(5), BIT<4>=0
17955            NEXT,   J/DELAY762C                             !
     (4414)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..110..010...0.1.0..0..0...0.0000...0..0000.0...11.000...100.001.101]
17956
17957    4415:  !(FREE)
17958    DELAY762C:
17959            SETUP,  RETURN/SETPRI762C,                      !EXEC 3. UWORDS AFTER SETTING PRIO, FOR DELAY
17960            P2,     PS[3-0]←D[3-0],                         !FOR USE IN TEST763A, PS[CC]="1010"
17961            P3,     PS[7-4]←D[7-4],                         !SET PRIO=(5), AT P3-T OF THIS UWORD
17962            NEXT,   GOTO-PAGE(7),                           !GO DO A JUMP, AND A BUTA(RETURN)
17963                    J/BUTD-IS-ZERO                          !DON'T REALLY CARE ABOUT THE RESULT OF THIS
     (4415)  DCS[0.00.0.0.0.0]  BM[0111..00.01..00.00..110..111...0.0.0..0..0...1.1010...0..0000.0...11.100...011.100.001]
17964
17965    7206:  !(FREE)
17966    SETPRI762C:
17967                                                            !BG-SERVICE(0)H SHOULD BE ASSERTED BY NOW
17968            SETUP,  RETURN/TEST762D,                        !RETURN TO START OF NEXT SUBTEST
17969            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
17970                    J/BUTBGSERVL                            !BG-SERVICE[0]H IN BIT<02>
     (7206)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.110]
17971
17972
17973
17974
17975
17976    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17977
17978    !TEST 762D CHECKS THAT BG-SERVICE[1]H+FLTPT-SERVICE-H IS HIGH, WHEN BG-SERVICE[1]H IS SET
```

```
17979    4741:
17980    TEST762D:
17981            P0,     LOAD-EMUA(ZTARGET417),                  !BIT<03> SET
17982                    LOAD-ERROR(TEST762D),                   !ERROR DIRECTORY KEY
17983                    DCS-CTR(C3.),                           !COMPARE AT TARGET
17984            NEXT,   J/GOBUT762D                             !
     (4741)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..001..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.110]
17985
17986    4416:  !(FREE)
17987    GOBUT762D:
17988            SETUP,  RETURN/TEST762E,                        !RETURN TO START OF NEXT SUBTEST
17989            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
17990                    J/BUTBGFPSERV                           !BG-SERVICE[1]H+FLTPT-SERVICE-H IN BIT<03>
     (4416)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.000.111]
17991
17992
17993
17994
17995
17996    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
17997
17998    !TEST 762E NOW READS THE "SERVICE" PORT OF THE STATUS MUX TO SEE:
17999    !SERVICE<15:00>H = "0 100 011 111 100 000"
18000    !
18001    !       IMPORTANT BITS ARE:
18002    !       B15 = DATI(1)H = 0              B14 = BG-SERVICE(1)H = 1        B11 = DATOB(1)H = 0
18003    !       B10 = DATO(1)H = 1              B09 = PBA<17>H = 1              B08 = PBA<16>H = 1
18004    !
18005    4730:
18006    TEST762E:
18007            P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
18008                    LOAD-ERROR(TEST762E),                   !ERROR DIRECTORY KEY
18009                    DCS-CTR(C10.),                          !COMPARE AT TARGET
18010            NEXT,   J/EXPEC762E                             !
     (4730)  DCS[1.00.1.0.0.0]  BM[0101..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.001.111]
18011
18012    4417:  !(FREE)
18013    EXPEC762E:
18014            P3,     CSPD[02]+EMIT,                          !EXPECTED VALUE OUT OF SERVICE PORT:
18015                    EMIT/043740,                            !"0100 0111 1110 0000"
18016            NEXT,   J/GOGET762E                             !
     (4417)  DCS[0.00.0.0.0.0]  BM[0100..10.01..11.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...100.010.000]
18017
18018    4420:  !(FREE)
18019    GOGET762E:
18020            P0,     BUMP-VERIFY,                            !
18021            SETUP,  RETURN/TEST762F,                        !GO TO SUBR WHICH:
18022            NEXT,   CALL[SERVICETOD]                        !CSP(02).XOR.SERVICE -> D, BUT(D=ZERO)
     (4420)  DCS[0.00.0.0.0.1]  BM[0100..00.11..10.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.101.000]
18023
18024
18025
```

```
18026     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
18027
18028     !TEST 762F CHECKS THAT SERVICE-H=NOT(INTR-HIGH-H*FLAG7(0)H*BG-SERVICE(0)H) IS HIGH,
18029     !  WHEN INTR-HIGH-H=HIGH, FLAG7(0)H=HIGH, AND BG-SERVICE(0)H=LOW
18030     4711:
18031     TEST762F:
18032             PO,     LOAD-ENUA(ZTARGET403),                  !BIT<00> SET
18033                     LOAD-ERROR(TEST762F),                   !ERROR DIRECTORY KEY
18034                     DCS-CTR(C3.),                           !COMPARE AT TARGET
18035             NEXT,   J/GOBUT762F                             !
     (4711)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.001]
18036
18037     4421:  !(FREE)
18038     GOBUT762F:
18039             SETUP,  RETURN/TEST763A,                        !RETURN TO START OF NEXT SUBTEST
18040             NEXT,   GOTO-PAGE(7),                           !BUT TABLE
18041                     J/BUTSERVICE                            !SERVICE-H IN BIT<00>
     (4421)  DCS[0.00.0.0.0.0]  BM[0100..00.11..11.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.101]
18042
18043
18044
18045
18046
18047     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
18048
18049     !THIS NEXT SEQUENCE OF TWO TESTS RESPONDS TO THE BUS INTERRUPT REQUEST BY:
18050     !(1) ASSERTING "ALLOW-BG[1]H", THUS ALLOWING THE BUS GRANT TO THE DL11-W, SO THAT
18051     !(2) "VECTOR-LOAD[1]H" WILL BE ASSERTED, INDICATING THAT THE DEVICE HAS PUT ITS
18052     !       VECTOR ON UNIBUS DATA<8:0>L, AND THEN
18053     !(3) ACTUALLY READING THE VECTOR FOR THE DL11-W (100)(8), AND VALIDATING ITS CORRECTNESS.
18054
18055
18056
18057     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
18058
18059     !TEST 763A CHECKS THAT AFTER "ALLOW-BG[1]H" IS GIVEN TO THE INTERRUPTING DEVICE,
18060     !THEN "VECTOR-LOAD[1]H" IS ASSERTED
18061     4761:
18062     TEST763A:
18063             PO,     LOAD-ENUA(VECTLOAD763A),                !COMPARE AT "VECTOR-LOAD[1]H" IN BIT<01> SET
18064                     LOAD-ERROR(TEST763A),                   !ERROR DIRECTORY KEY
18065                     DCS-CTR(C5.),                           !COMPARE AT TARGET
18066             NEXT,   J/EXPEC763A                             !
     (4761)  DCS[1.00.1.0.0.0]  BM[1010..00.10..01.11..011..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.010]
18067
18068     4422:  !(FREE)
18069     EXPEC763A:
18070             PO,     BUMP-VERIFY,                            !COUNT
18071             P3,     CSPD[01]←EMIT, EMIT/100,                !DL11-W VECTOR IS (100)8
18072             NEXT,   J/ALLOW763A                             !
     (4422)  DCS[0.00.0.0.0.1]  BM[0000..10.00..00.01..000..000...0.0.0..0..0...0.1110...1..0000.0...11.000...111.011.001]
18073
18074     4731:                                                   !*** *** *01
```

```
18075    ALLOW763A:
18076            P0,     BUSDIN←PS-[I],                          !NOISE BITS ON BUSDIN TO IMPEDE READING VECTOR
18077                                                            !AT THIS POINT PS=(000252)
18078            P2,     ALLOW-BG[1]H-[I],                       !GIVE BUS GRANT TO PENDING INTERRUPT
18079            NEXT,   J/READVECT763A                          !
     (4731)  DCS[0.00.0.0.0.0]  BM[0100..00.01..10.01..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...100.010.011]
18080
18081    4423:  !(FREE)
18082    READVECT763A:
18083            P3,     CSPD[07]←BUSDIN,                        !MUST READ BUSDIN=VECTOR RITE HERE, OR
18084                                                            !WE WILL LOSE IT
18085                    EMIT/052525,                            !NOISE ON EMIT
18086            NEXT,   J/TESTVECT763A                          !
     (4423)  DCS[0.00.0.0.0.0]  BM[0101..10.01..01.01..010..101...0.0.0..0..0...0.1000...1..0000.0...11.000...100.010.100]
18087
18088    4424:  !(FREE)
18089    TESTVECT763A:
18090            P2-T,   SR←CSPD(D01),                           !SR=(000100), EXPECTED VECTOR
18091            NEXT,   BUTR(VECTOR-LOAD),                      !IF SET, "VECTLOAD763A",  THIS IS EXPECTED
18092                    J/ALLOW763A                             !IF CLR, "ALLOW763A",  VECTOR-LOAD[1]H NOT SET, ERROR
     (4424)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..000...0.0.1..0..0...0.1110...0..0000.0...10.001...111.011.001]
18093
18094
18095
18096
18097    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
18098
18099    !IF VECTOR-LOAD[1]H="1", COME TO HERE.
18100    !
18101    !TEST 763B NOW CHECKS THAT THE CORRECT VECTOR FOR THE DL11-W = 100(8) WAS READ
18102    4733:                                                   !*** *** *11
18103    VECTLOAD763A:
18104            P2-T,   D←SR-XOR-CSPD(D07),                     !COMPARE EXPECTED VECTOR:RECEIVED VECTOR
18105            NEXT,   J/TEST763B                              !
     (4733)  DCS[0.00.0.0.0.0]  BM[0110..10.00..00.00..000..000...0.1.0..0..0...0.1000...0..0000.0...11.000...111.010.000]
18106
18107    4720:
18108    TEST763B:
18109            P0,     LOAD-EMUA(ZTARGET402),                  !SETUP FOR D=ZERO TEST
18110                    LOAD-ERROR(TEST763B),                   !ERROR DIRECTORY KEY
18111                    DCS-CTR(C3.),                           !COMPARE AT TARGET
18112            NEXT,   J/GOBUT763B                             !
     (4720)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.101]
18113
18114    4425:  !(FREE)
18115    GOBUT763B:
18116            SETUP,  RETURN/TEST763C,                        !RETURN TO START OF NEXT SUBTEST
18117            NEXT,   GOTO-PAGE(7),                           !BUT TABLE
18118                    J/BUTD-IS-ZERO                          !CHECK EQUALITY
     (4425)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.10..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.001]
18119
18120
18121
```

```
18122
18123
18124     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
18125
18126     !TEST 763C CHECKS THAT VECTOR-LOAD[1]H=-(UNIBUS-INTR-L) IS AGAIN LOW
18127     4721:
18128     TEST763C:
18129             PO,     LOAD-EMUA(ZTARGET401),                          !BIT<01> CLEAR
18130                     LOAD-ERROR(TEST763C),                           !ERROR DIRECTORY KEY
18131                     DCS-CTR(C3.),                                   !COMPARE AT TARGET
18132                     BUMP-VERIFY,                                    !COUNT
18133             NEXT,   J/GOBUT763C                                     !
        (4721)  DCS[1.00.1.0.0.1]  BM[1100..00.11..11.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.110]
18134
18135     4426:  !(FREE)
18136     GOBUT763C:
18137             SETUP,  RETURN/TEST763D,                                !RETURN TO START OF NEXT SUBTEST
18138             NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
18139                     J/BUTVECTLOAD                                   !VECTOR-LOAD[1]H IN BIT<01>
        (4426)  DCS[0.00.0.0.0.0]  BM[0100..00.11..10.01..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.100.110]
18140
18141
18142
18143
18144     ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
18145
18146     !TEST 763D CHECKS THAT BG-SERVICE(0)H=BR>PS-L IS HIGH WHEN UNIBUS INTR REQUEST HAS BEEN SATISFIED
18147     4710:
18148     TEST763D:
18149             PO,     LOAD-EMUA(ZTARGET407),                          !BIT<02> SET  (ACTIVE LOW)
18150                     LOAD-ERROR(TEST763D),                           !ERROR DIRECTORY KEY
18151                     DCS-CTR(C3.),                                   !COMPARE AT TARGET
18152             NEXT,   J/GOBUT763D                                     !
        (4710)  DCS[1.00.1.0.0.0]  BM[1100..00.11..11.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...100.010.111]
18153
18154     4427:  !(FREE)
18155     GOBUT763D:
18156             SETUP,  RETURN/SCOPE763,                                !RETURN TO SCOPE LOOP TEST WORD
18157             NEXT,   GOTO-PAGE(7),                                   !BUT TABLE
18158                     J/BUTBGSERVL                                    !BG-SERVICE[0]H IN BIT<02>
        (4427)  DCS[0.00.0.0.0.0]  BM[0100..00.10..00.11..000..111...0.0.0..0..0...0.0000...0..0000.0...11.100...011.001.110]
18159
18160
18161
18162     4430:  !(FREE)
18163     SCOPE763:
18164             PO,     BUSDIN+EMIT-[1],                                !RESET PROC UCON FOR EMIT
18165             P2,     PS+D-[1],                                       !ZAP THE PS TO ZERO
18166             NEXT,   BUTD[SCOPE],                                    !NO ERROR:  "KILL764A"  (+1. WORDS)
18167                     J/KILL764A                                      !   ERROR:  "EXPEC763A"  (-11. WORDS)
        (4430)  DCS[0.00.0.1.0.0]  BM[1000..00.00..00.01..010..010...0.0.0..0..0...1.1011...0..0000.0...11.000...111.110.011]
18168
```

```
18169
18170    ! - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
18171
18172
18173    !***  ALL DONE WITH LINE CLOCK, DISABLE IT FROM FURTHER INTERRUPTS BEFORE LEAVING FOR EOP  ***
18174
18175    4763;
18176    KILL764A:
18177            P2-T,   D←ZERO, D[C]←ALU00,                     !NOW MUST GO KILL THE LINE CLOCK
18178            P3,     DATO,                                   !BA=(177546), DL11-W CSR
18179                    BUTA[CLR-FLAG-RES-UCON),                !ZAP UCON, RES-CONTROL FOR EOP ROUTINE (MUST BE DONE)
18180            NEXT,   J/EOP001                                !
     (4763)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..010...0.1.0..0..0...1.0010...0..0000.0...11.010...100.011.0011]
18181
18182
18183
18184
18185
18186
18187
18188    !.PAGE==========================================================================================================
18189
18190
18191    .TOC   *   END OF PASS CODE
18192
18193    !*****************************************************************************************
18194    !
18195    !       FINAL ENTRY HERE TO TEST FOR MULTIPLE PASSES, VERIFY MODE, ET AL
18196    !
18197    !
18198    !       *** INDICATIONS ON CONSOLE DISPLAY ***
18199    !
18200    !               0.0.0.0.0.0.    DCS IS RUNNING; REQUIRES APPROX 8. SECONDS/64. PASSES
18201    !                               "RUN"     "PROC"     "USER"     "CONSOLE"     "BATTERY"
18202    !                               (ON)      (BLINK)    (BLINK)    (OFF)           (OFF)
18203    !
18204    !               0 0 0 0 0 0     ERROR DETECTED / PASS=1 / SCOPE LOOPING
18205    !       OR      2 1 2 1 2 1
18206    !
18207    !               0.0.0.0.0.0.    ERROR DETECTED / 1<PASS<64. / SCOPE LOOPING
18208    !       OR      2.1.2.1.2.1.
18209    !
18210    !               1.2.3.3.2.1.    SUCCESSFUL 64. PASSES COMPLETED
18211    !
18212    !
18213    !       AT END OF PASS, THE GENERAL REGISTERS (BASE MACHINE R0-R7)
18214    !         CONTAIN THE FOLLOWING INFORMATION:
18215    !
18216    !               R0  =  (NU)
18217    !               R1  =  (NU)
18218    !               R2  =  (NU)
18219    !               R3  =  (NU)
18220    !               R4  =  (NU)
18221    !               R5  =  REVISION NUMBER OF DCS MICROCODE, WITH
```

```
18222    !                    BIT15 SET TO INDICATE END OF PASS
18223    !              R6  =  (NU)
18224    !              R7  =  (123321), END OF PASS INDICATION CONSTANT
18225    !
18226    !#############################################################################################
18227
18228
18229    4431:  !(FREE)
18230    EOP001:
18231           P0,     DCS-CTR(C15.),                          !HOLD UP ERROR COMPARE
18232           NEXT,   GOTO-PAGE(6),                           !XFER
18233                   J/EOP002                                !
    (4431)  DCS[0.00.1.0.0.0]  BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...100.101.010]
18234
18235
18236    6452:  !(FREE)
18237    EOP002:
18238           P3,     CSPD[01]←EMIT, EMIT/123321,             !SETUP SUCCESSFUL END OF PASS CONSTANT
18239           NEXT,   J/EOP003                                !
    (6452)  DCS[0.00.0.0.0.0]  BM[1010..10.01..10.11..010..001...0.0.0..0..0...0.1110...1..0000.0...11.000...101.001.000]
18240
18241
18242    6510:  !(FREE)
18243    EOP003:
18244           P2-T,   D←CSPD(D01), D[C]←0,                    !GET EOP CONSTANT INTO
18245           P3,     PC←D,                                   !  GPR PC, ON BOTH SP SIDES
18246           NEXT,   J/EOP004                                !  FOR DISPLAY FROM "CONSOLE HALT" ROUTINE
    (6510)  DCS[0.00.0.0.0.0]  BM[1010..10.00..10.01..111..000...0.1.0..0..0...0.1110...0..0011.0...11.000...101.001.001]
18247
18248
18249    6511:  !(FREE)
18250    EOP004:
18251           SETUP,  RETURN/EOP005,                          !GO TO DISPLAY-D-IN-LIGHTS ROUTINE
18252           NEXT,   CALL[DISPLAY]                           !  WHICH SHOULD PUT (212121) INTO DISPLAY
    (6511)  DCS[0.00.0.0.0.0]  BM[0111..00.01..00.01..001..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.010.001]
18253                                                           !  FOR INTERMEDIATE EOP INDICATION
18254
18255    7211:  !(FREE)
18256    EOP005:
18257           P0,     SIGNAL-EOP,                             !TRY TO SIGNAL EOP
18258           P2-T,   SR←ALL-ONES,                            !SET SR TO ALL ONES, FOR FULL BASE MACHINE INIT
18259           NEXT,   GOTO-PAGE(6),                           !XFER TO 6
18260                   BUTD[VERIFY-MODE],                      !IF TRUE,   "VFY001"  (NEXT PAGE FOLLOWING)
18261                   J/EOP006                                !IF FALSE,  "EOP006"  (NEXT MICROWORD)
    (7211)  DCS[0.00.0.0.1.0]  BM[1111..00.00..11.01..101..110...0.0.1..0..0...0.0000...0..0000.0...11.100...111.111.110]
18262
18263
18264    6776:
18265    EOP006:
18266           P0,     DCS-CTR(C11.),                          !HOLD UP ERROR COMPARE
18267           P3-U,   SET-CONSOLE-DP-LEDS,                    !UCON SET DP LEDS, INDICATING >=1 SUCCESSFUL PASSES
```

```
18268            NEXT,   BUTD[EOP-OVERFLOW],                    !IF TRUE,   "EOP007" FOLLOWING, DONE 64. PASSES
18269                    J/EOP007                               !IF FALSE,  "TEST001" GO FOR NEXT PASS AT (4000)
     (6776)  DCS[0.00.1.0.0.0]  BM[0100..00.00..00.00..110..001...0.0.0..0..0...1.1011...0..0000.0...11.000...101.001.010]
18270                                                           !BEGIN COUNTDOWN
18271                                                           !  3 ... 2 ... 1 .
18272
18273
18274    6512:  !(FREE)
18275    EOP007:
18276            SETUP,  RETURN/EOP010,                         !GO TO SUBR THAT PUTS REV-NUMBER, WITH
18277            NEXT,   GOTO-PAGE(7),                          !  B<15>=(1), INTO B.M. GPR "R5"
18278                    J/INSERTEOPREVNO                       !
     (6512)  DCS[0.00.0.0.0.0]  BM[0111..00.01..00.01..010..111...0.0.0..0..0...0.0000...0..0000.0...11.100...010.001.100]
18279
18280
18281    7212:  !(FREE)
18282    EOP010:
18283            SETUP,  RETURN/CON99,                          !RETURN TO "FORCE CONSOLE-MODE HALT" ROUTINE IN BASE MACHINE
18284            NEXT,   GOTO-PAGE(3),                          !GOTO "INIT---" ROUTINE FOR FULL BASE MACHINE
18285                    J/INIT01                               !  MICROCODE INITIALIZATION, BUTA(RETURN) AT END TO "CON99"
     (7212)  DCS[0.00.0.0.0.0]  BM[0001..00.00..01.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.100...100.001.010]
18286
18287
18288
18289
18290
18291    !.PAGE=========================================================================================================================
18292
18293
18294    .TOC   *   VERIFY MODE CODE
18295
18296    !
18297    !       VERIFY MODE ENTERS HERE:
18298    !
18299
18300    6774:
18301    VFY001:
18302            P0,     DCS-CTR(C4.),                          !LOAD COUNTER FOR COMPARE IN 4. MICROWORDS
18303            NEXT,   GOTO-PAGE(4),                          !ZFER
18304                    J/VFY002                               !
     (6774)  DCS[0.00.1.0.0.0]  BM[1011..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.100...100.001.010]
18305
18306
18307    4412:  !(FREE)
18308    VFY002:
18309            P3,     CLEAR-CONSOLE-LED,                     !MAKE "CONSOLE" LED BLINK, JUST FOR FUN
18310            NEXT,   J/VFY003                               !
     (4412)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..010..001...0.0.0..0..0...1.1011...0..0000.0...11.000...010.101.101]
18311
18312    4255:
```

```
18313    VFY003:
18314            PO,     LOAD-ENUA(ZTARGET523),                  !ERROR CODE = [4255], ENUA = [7523]
18315                    LOAD-ERROR(VFY003),                     !ERROR DIRECTORY KEY
18316                    BUMP-VERIFY,                            !GIVE A VERIFY PULSE
18317            NEXT,   J/VFY004                                !
    (4255)  DCS[1.00.0.0.0.1]  BM[0000..00.11..11.01..010..011...0.0.0..0..0...0.0000...0..0000.0...11.000...100.011.011]
18318
18319
18320    4433:  !(FREE)
18321    VFY004:
18322            SETUP,  RETURN/VFY005,                          !RETURN TO INLINE
18323            NEXT,   GOTO-PAGE(7),                           !BUT'S ARE ON PAGE 7
18324                    J/ZTARGET522                            !TNUA = [7522], NOT EQUAL TO ENUA
    (4433)  DCS[0.00.0.0.0.0]  BM[0111..00.01..11.11..101..111...0.0.0..0..0...0.0000...0..0000.0...11.100...101.010.010]
18325
18326
18327    !       NEXT MICROWORD COMES FROM ZTARGET522, AT WHICH THE ENABLED COMPARE
18328    !       TAKES PLACE.  ENUA WAS SETUP NOT EQUAL TO TNUA, SO ERROR SHOULD BE SIGNALED
18329
18330
18331
18332    7375:
18333    VFY005:
18334            P3,     SET-CONSOLE-LED,                        !THE OTHER HALF OF MAKING IT BLINK
18335            NEXT,   BUTD[SCOPE],                            !NO ERROR:  "VFY005"  [SELF LOOP, SHOULDN'T HAPPEN]
18336                    J/VFY005                                !   ERROR:  "VFY006"  [SHOULD HAPPEN]
    (7375)  DCS[0.00.0.1.0.0]  BM[0100..00.00..00.00..100..001...0.0.0..0..0...1.1011...0..0000.0...11.000...011.111.101]
18337
18338
18339    7374:
18340    VFY006:
18341            PO,     SIGNAL-EOP,                             !GIVE AN EOP PULSE, AFTER ERROR SIGNALED
18342            NEXT,   GOTO-PAGE(6),                           !LOOP BACK
18343                    J/VFY001                                !  ON CONTINUOUS VERIFY
    (7374)  DCS[0.00.0.0.1.0]  BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.100...111.111.100]
18344
18345
18346
18347
18348
18349    !.PAGE=============================================================================================================
18350
18351
18352    .TOC    *   DCS MICROCODE REVISION NUMBER
18353
18354    !       THE FOLLOWING ROUTINE WILL PUT THE CURRENT DCS MICROCODE REVISION NUMBER
18355    !       INTO B.M. GPR "R5", FROM THE EMIT FIELD OF THE MICROWORD.
18356    !
18357    !       THE ENTRY "INSERTREVNO" IS USED, EXCEPT AT END OF PASS; IE B<15>=(0)
18358    !       THE ENTRY "INSERTEOPREVNO" IS USED ONLY AT END OF PASS; IE, B<15>=(1)
18359
18360
```

```
18361    7214:  !(FREE)
18362    INSERTEOPREVNO:
18363           P0,     BUSDIN←EMIT-[1],                        !SELECT EMIT
18364           NEXT,   J/INSERT02                              !
     (7214)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...010.001.101]
18365
18366    7215:  !(FREE)
18367    INSERT02:
18368           P3,     CSPD[17]←EMIT, EMIT/REV-NUMBER-AND-B15, !DCS REVISION NUMBER, B15 SET
18369           NEXT,   J/INSERT04                              !
     (7215)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.01..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...010.010.000]
18370
18371
18372    7216:  !(FREE)
18373    INSERTREVNO:
18374           P0,     BUSDIN←EMIT-[1],                        !SELECT EMIT
18375           NEXT,   J/INSERT03                              !
     (7216)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...010.001.111]
18376
18377    7217:  !(FREE)
18378    INSERT03:
18379           P3,     CSPD'17]←EMIT, EMIT/REV-NUMBER,         !DCS REVISION NUMBER, B15 CLEAR
18380           NEXT,   J/INSERT04                              !
     (7217)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.01..000..001...0.0.0..0..0...0.0000...1..0000.0...11.000...010.010.000]
18381
18382
18383    7220:  !(FREE)
18384    INSERT04:
18385           P2-T,   D←CSPD(D17), D[C]←0,                    !GET IT
18386           P3,     RS←D,                                   !  AND STUFF IT
18387           NEXT,   J/RESETUCONP                            !    AND RETURN
     (7220)  DCS[0.00.0.0.0.0]  BM[1010..10.00..10.01..110..000...0.1.0..0..0...0.0000...0..0011.0...11.000...010.111.001]
18388
18389
18390
18391    !.PAGE=============================================================================================================
18392
18393
18394    .TOC   *   COMMON SUBROUTINES
18395
18396    .TOC   *     CONSOLE DISPLAY SUBROUTINE
18397
18398    !
18399    !       DISPLAYS NUMBER REPRESENTED BY D<05:00>#D<05:00>#D<05:00>
18400    !       AS SIX OCTAL DIGITS IN CONSOLE 7 SEGMENT DISPLAY
18401    !
18402
18403    7221:  !(FREE)
18404    DISPLAY:
18405           P3-U,   CLEAR-CONSOLE-COUNTER,                  !POINT TO DIGITS ....XX
18406           NEXT,   J/DISP002                               !
     (7221)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..010..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.010.010]
18407
18408
```

```
18409     7222:  !(FREE)
18410     DISP002:
18411            P3-U,   STROBE-CONSOLE-DISPLAY,                 !WRITE OUT DIGITS ....XX
18412            NEXT,   J/DISP003                               !
     (7222)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..000..001...0.0.0..0..0...1.1011...0..0000.0...11.000...010.010.011]
18413
18414
18415     7223:  !(FREE)
18416     DISP003:
18417            P3-U,   INCREMENT-CONSOLE-COUNTER,              !POINT TO DIGITS ..XX..
18418            NEXT,   J/DISP004                               !
     (7223)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..100..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.010.100]
18419
18420
18421     7224:  !(FREE)
18422     DISP004:
18423            P3-U,   STROBE-CONSOLE-DISPLAY,                 !WRITE OUT DIGITS ..XX..
18424            NEXT,   J/DISP005                               !
     (7224)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..000..001...0.0.0..0..0...1.1011...0..0000.0...11.000...010.010.101]
18425
18426
18427     7225:  !(FREE)
18428     DISP005:
18429            P3-U,   INCREMENT-CONSOLE-COUNTER,              !POINT TO DIGITS XX....
18430            NEXT,   J/DISP006                               !
     (7225)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..100..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.010.110]
18431
18432
18433     7226:  !(FREE)
18434     DISP006:
18435            P3-U,   STROBE-CONSOLE-DISPLAY,                 !WRITE OUT DIGITS XX....
18436            NEXT,   J/RESETUCONP                            !GO RESET PROC UCON/EMIT, DO A (RETURN)
     (7226)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.00..000..001...0.0.0..0..0...1.1011...0..0000.0...11.000...010.111.001]
18437
18438
18439
18440
18441
18442     !.PAGE=============================================================================================================
18443
18444
18445     .TOC   *      CLEAR I-O / BUS CONTROL / SERVICE AREA STATUS LATCHES SUBR
18446
18447
18448     !
18449     !       THIS SUBR CLEARS OUT, VIA I-O UCON COMMANDS, THOSE STATUS LATCHES
18450     !       CONCERNED WITH SERVICE CONDITIONS, UNIBUS ERROR CONDITIONS, ETC.
18451     !
18452
18453     7227:  !(FREE)
18454     CLEAR-I-O-A:
18455            P3,     BUS-INIT-UCON-[1],                      !DO A 10 MILLISEC UNIBUS INIT
18456            NEXT,   J/CLEAR-I-O-B                           !
     (7227)  DCS[0.00.0.0.0.0]  BM[0100..00.01..11.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.011.000]
```

```
18457
18458     7230:  !(FREE)
18459     CLEAR-I-O-B:
18460               P3,     CLR-JAM-ERRORS-[I],                    !RESET CACHE ERROR STATUS
18461               NEXT,   J/CLEARIOO2                            !
     (7230)  DCS[0.00.0.0.0.0]  BM[0100..00.00..10.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.011.001]
18462
18463     7231:  !(FREE)
18464     CLEARIOO2:
18465               P3,     CLEAR-CONSOLE-SERVICE,                 !CLEAR OUT CONSOLE SRVC(1)H
18466               P3,     CLR-NPR-TIMEOUT-[I],                   !RESET NPR/SACK TIME OUT STATUS
18467               NEXT,   J/CLEARIOO4                            !
     (7231)  DCS[0.00.0.0.0.0]  BM[0100..00.00..11.00..110..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.011.010]
18468
18469     7232:  !(FREE)
18470     CLEARIOO4:
18471               P3,     CLEAR-CONSOLE-LED,                     !SETUP FOR 16. BIT ADDRESS MODE ON UNIBUS
18472               P3,     CLR-PWR-FAIL-[I],                      !RESET POWER FAIL STATUS
18473               NEXT,   J/CLEARIOO5                            !
     (7232)  DCS[0.00.0.0.0.0]  BM[0100..00.01..00.00..010..001...0.0.0..0..0...1.1011...0..0000.0...11.000...010.011.011]
18474
18475     7233:  !(FREE)
18476     CLEARIOO5:
18477               P3,     CLR-YELLOW-ZONE-[I],                   !RESET YELLOW ZONE STATUS
18478               NEXT,   J/RESETUCONP                           !
     (7233)  DCS[0.00.0.0.0.0]  BM[0100..00.01..01.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.111.001]
18479
18480     !"RESETUCONP" IS AT END OF "DINTOIR" SUBROUTINE
18481     !THIS WORD  (1) ENABLES BUSDIN←EMIT,  (2) ENABLES PROC EN-CLK-IR,
18482     !AND EXITS WITH A BUTA(RETURN)
18483
18484
18485
18486
18487
18488     !.PAGE=================================================================================================================
18489
18490
18491     .TOC   *      SUBR FOR PUTTING SELECTED PORTIONS OF D[15-00] INTO IR
18492
18493     !
18494     !         THESE SUBR(S) ARE USED IN TESTING THE ALU/LOGIC FUNCTIONS.
18495     !
18496     !         NOTE:  ENTRY POINTS "D[15-12]", "D[11-06]", "D[05-00]" EXPECT THAT:
18497     !                  (1) 'IR←DBUF', 'DBUF←D' FUNCTIONS ARE ALREADY ENABLED
18498     !                  (2) THE FOLLOWING CONSTANTS ARE IN CSP(17:14):
18499     !                           CSP(17) = (007700);      CSP(16) = (170000);
18500     !                           CSP(15) = (000077);      CSP(14) = (000100);
18501     !
18502     !         FURTHERMORE:
18503     !                  (1) ENTRY POINT "DZERO" SETS UP THE UCONS:
18504     !                           'IR←DBUF'  'DBUF←D'
18505     !                  (2) ENTRY POINT "D[15-12]" COPIES THE ORIGINAL PATTERN, LEFT IN
18506     !                           D, INTO ASPHI[17] FOR SAFEKEEPING, AND REUSE LATER
```

```
18507     !
18508
18509
18510     7234:  !(FREE)
18511     D[15-12]:
18512             P2-U,   IR←DBUF,                                !JUST HAPPENS, DONT CARE NOW
18513             P3,     DBUF←D,                                 !PATTERN IN D -> DBUF
18514                     A#BSPHI[17]←D,                          !SAVE IN ASPHI, TOO
18515             NEXT,   J/D1512A                                !
     (7234)  DCS[0.00.0.0.0.0]  BM[0000..00.11..00.01..011..000...0.0.0..0..0...1.1010...0..1011.0...11.000...010.011.101]
18516
18517     7235:  !(FREE)
18518     D1512A:
18519             P2-U,   IR←DBUF,                                !SEND DBUF -> IR
18520             P3,     DBUF←D,                                 !JUST HAPPENS, DONT CARE NOW
18521             NEXT,   J/BUTIR15-12                            !IR<15:12>H IN BIT<03:00> "BUT"
     (7235)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.000.000]
18522
18523     7236:  !(FREE)
18524     D[11-06]:
18525             P2-T,   SR←ASPHI[17]-AND-007700,                !MASK ALL BITS EXCEPT D<11:06> TO ZEROES
18526             NEXT,   J/D1106A                                !
     (7236)  DCS[0.00.0.0.0.0]  BM[1011..11.00..11.01..011..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.011.111]
18527
18528     7237:  !(FREE)
18529     D1106A:
18530             P2-T,   D←SR-IOR-170000, SAVE-D[C],             !FORCE BITS D<15:12> TO ONES
18531                                                             !THIS MANUVER SHOULD FORCE INSTRS DIAGNOSTIC (E78)
18532                                                             !ROM ADDRESSES (752), (725) WHEN PATTERN GOES INTO IR
18533             P2-U,   IR←DBUF,                                !JUST HAPPENS, DONT CARE NOW
18534             P3,     DBUF←D,                                 !PUT PATTERN JUST SET IN D INTO DBUF
18535             NEXT,   J/DTOIRB                                !
     (7237)  DCS[0.00.0.0.0.0]  BM[1110..11.01..00.00..000..111...0.1.0..0..0...1.1010...0..0000.0...11.000...010.100.011]
18536
18537     7240:  !(FREE)
18538     D[05-00]:
18539             P2-T,   SR←ASPHI[17]-AND-000077,                !MASK ALL BITS EXCEPT D<05:00> TO ZEROES
18540             NEXT,   J/D0500A                                !
     (7240)  DCS[0.00.0.0.0.0]  BM[1011..11.10..11.01..011..000...0.0.1..0..0...0.0000...0..0000.0...11.000...010.100.001]
18541
18542     7241:  !(FREE)
18543     D0500A:
18544             P2-T,   D←SR-IOR-000100, SAVE-D[C],             !FORCE BIT D<06> TO A ONE
18545                                                             !THIS MANUVER SHOULD FORCE INSTRS DIAGNOSTIC (E88)
18546                                                             !ROM ADDRESSES (152), (125) WHEN PATTERN GOES INTO IR
18547             P2-U,   IR←DBUF,                                !JUST HAPPENS, DONT CARE NOW
18548             P3,     DBUF←D,                                 !PUT PATTERN JUST SET IN D INTO DBUF
18549             NEXT,   J/DTOIRB                                !
     (7241)  DCS[0.00.0.0.0.0]  BM[1110..11.11..00.00..000..111...0.1.0..0..0...1.1010...0..0000.0...11.000...010.100.011]
18550
18551     7242:  !(FREE)
18552     DZERO:
18553             P2-U,   IR←DBUF-[I],                            !JUST HAPPENS, DONT CARE
18554             P3,     DBUF←D-[I],                             !COPY PATTERN IN D TO DBUF
```

```
18555                   NEXT,   J/DTOIRB                                        !
      (7242)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...010.100.011]
18556
18557       7243:  !(FREE)
18558       DTOIRB:
18559                   P2-U,   IR←DBUF,                                        !NOW COPY PATTERN IN DBUF TO IR
18560                   P3,     DBUF←D,                                         !JUST HAPPENS, DONT CARE
18561                   NEXT,   J/BUTINSTRS                                     !GO DO INSTRS "BUT" ON PATTERN IN IR
      (7243)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...011.000.001]
18562
18563
18564
18565
18566
18567       !.PAGE=============================================================================================================
18568
18569
18570       .TOC   *     UCON SUBROUTINES (FLAGS, PS, FPS, CUA, SERVICE, JAM, PBA)
18571
18572       !
18573       !       THESE SUBROUTINES MANIPULATE THE PROCESSOR UCONS, AND VARIOUS OTHER BUSDIN DRIVERS
18574       !
18575       !               ASPLO(17) = A TEMPORARY LOCATION, DESTROYED
18576       !
18577       !               CSP(02) = VALUE EXPECTED TO BE READ
18578       !               CSP(03) = ACTUAL VALUE READ
18579       !               CSP(04) = MASK VALUE
18580       !
18581       !               AT RETURN, D = (BUSDINSELECT.AND.MASKVALUE).XOR.EXPECTEDVALUE
18582       !
18583
18584       7244:  !(FREE)
18585       CLRSERVICETOD:
18586                   P3,     CSPD[02]←EMIT, EMIT/000340,                     !SERVICE PORT OF STATUS:  ALL BITS RESET
18587                   NEXT,   J/CJESERVICETOD                                 !
      (7244)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...010.100.111]
18588
18589       7245:  !(FREE)
18590       DATISERVICETOD:
18591                   P3,     CSPD[02]←EMIT, EMIT/100340,                     !SERVICE PORT OF STATUS:  ONLY DATI[1]H SET
18592                   NEXT,   J/CJESERVICETOD                                 !
      (7245)  DCS[0.00.0.0.0.0]  BM[1000..10.00..00.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...010.100.111]
18593
18594       7246:  !(FREE)
18595       DATOSERVICETOD:
18596                   P3,     CSPD[02]←EMIT, EMIT/002340,                     !SERVICE PORT OF STATUS:  ONLY DATO[1]H SET
18597                   NEXT,   J/CJESERVICETOD                                 !
      (7246)  DCS[0.00.0.0.0.0]  BM[0000..10.01..00.11..100..000...0.0.0..0..0...0.1101...1..0000.0...11.000...010.100.111]
18598
18599       7247:  !(FREE)
18600       CJESERVICETOD:
18601                   P3,     CLR-JAM-ERRORS-[I],                             !SPECIAL ENTRY POINT TO CLEAR OUT JAM
18602                   NEXT,   J/SERVICETOD                                    !  PORT OF STATUS MUX, BEFORE READ SERVICE
      (7247)  DCS[0.00.0.0.0.0]  BM[0100..00.00..10.00..000..000...0.0.0..0..0...1.1011...0..0000.0...11.000...010.101.000]
```

```
18603
18604    7250:  !(FREE)
18605    SERVICETOD:
18606           PO,     BUSDIN←SERVICE-[I],                    !SERVICE (PORT 1) OF STATUS MUX
18607           NEXT,   J/GETPROCDAT                           !
     (7250)  DCS[0.00.0.0.0.0]  BM[0100..01.00..00.00..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]
18608
18609    !      -       -       -       -       -       -       -       -       -       -       -
18610
18611    7251:  !(FREE)
18612    PBATOD:
18613           PO,     BUSDIN←PBA-[I],                        !PBA (PORT 3) OF STATUS MUX
18614           NEXT,   J/GETPROCDAT                           !
     (7251)  DCS[0.00.0.0.0.0]  BM[1100..01.00..00.00..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]
18615
18616    !      -       -       -       -       -       -       -       -       -       -       -
18617
18618    7252:  !(FREE)
18619    FLAGFPSTOD:
18620           PO,     BUSDIN←FLAGS⊕FPS-[I],                  !PUT FLAGS, FPS ON BUSDIN
18621           NEXT,   J/GETPROCDAT                           !
     (7252)  DCS[0.00.0.0.0.0]  BM[0000..00.00..11.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]
18622
18623    !      -       -       -       -       -       -       -       -       -       -       -
18624
18625    7253:  !(FREE)
18626    PSTOD:
18627           PO,     BUSDIN←PS-[I],                         !PUT PS ON BUSDIN
18628           NEXT,   J/GETPROCDAT                           !
     (7253)  DCS[0.00.0.0.0.0]  BM[0000..00.00..10.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]
18629
18630    !      -       -       -       -       -       -       -       -       -       -       -
18631
18632    7254:  !(FREE)
18633    ODDJAMTOD:
18634           P3,     CSPD[02]←EMIT, EMIT/101004,            !JAM PORT OF STATUS:  ONLY ODD-ADDR[1]H SET
18635           NEXT,   J/JAMTOD                               !
     (7254)  DCS[0.00.0.0.0.0]  BM[1000..10.00..10.00..000..100...0.0.0..0..0...0.1101...1..0000.0...11.000...010.101.110]
18636
18637    7255:  !(FREE)
18638    CLRJAMTOD:
18639           P3,     CSPD[02]←EMIT, EMIT/001000,            !JAM PORT OF STATUS:  ALL BITS RESET
18640           NEXT,   J/JAMTOD                               !
     (7255)  DCS[0.00.0.0.0.0]  BM[0000..10.00..10.00..000..000...0.0.0..0..0...0.1101...1..0000.0...11.000...010.101.110]
18641
18642    7256:  !(FREE)
18643    JAMTOD:
18644           PO,     BUSDIN←JAM-[I],                        !PUT JAM REG (STATUS MUX PORT 2)
18645           NEXT,   J/GETPROCDAT                           !ONTO BUSDIN
     (7256)  DCS[0.00.0.0.0.0]  BM[1100..00.00..00.00..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]
18646
18647    !      -       -       -       -       -       -       -       -       -       -       -
18648
18649    7257:  !(FREE)
```

```
18650    CUATOD:
18651            P0,     BUSDIN←CUA-[I],                          !PUT CUA REG (HBMUX PORT 2)
18652            NEXT,   J/GETPROCDAT                             !ONTO BUSDIN
     (7257)  DCS[0.00.0.0.0.0]  BM[0000..00.00..01.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...011.111.011]
18653
18654    !       -       -       -       -       -       -       -       -       -       -
18655
18656    7373:
18657    GETPROCDAT:
18658            P3,     CSPD[03]←BUSDIN,                         !GET PREVIOUSLY ENABLED PROC DATA
18659            NEXT,   J/GETMSKPROCDAT                          !
     (7373)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1100...1..0000.0...11.000...010.110.000]
18660
18661    7260:  !(FREE)
18662    GETMSKPROCDAT:
18663            P2-T,   D←CSPD(D04), D[C]←D,                     !GET MASK VALUE
18664            P3,     ASPL0[17]←D,                             !INTO A-SIDE
18665            NEXT,   J/MSKPROCDAT                             !
     (7260)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.01..011..000...0.1.0..0..0...0.1011...0..0001.0...11.000...010.110.001]
18666
18667    7261:  !(FREE)
18668    MSKPROCDAT:
18669            P2-T,   D←ASPL0[17]-AND-CSPD(D03), SAVE-D[C],    !MASK OUT UNWANTED BITS
18670            P3,     ASPL0[17]←D,                             !AND WRITE BACK
18671            NEXT,   J/CMPPROCDAT                             !
     (7261)  DCS[0.00.0.0.0.0]  BM[1011..10.00..10.01..011..111...0.1.0..0..0...0.1100...0..0001.0...11.000...010.110.010]
18672
18673    7262:  !(FREE)
18674    CMPPROCDAT:
18675            P2-T,   D←ASPL0[17]-XOR-CSPD(D02), SAVE-D[C],    !COMPARE OBTAINED, EXPECTED BITWISE
18676            NEXT,   J/RESETPROCDAT                           !
     (7262)  DCS[0.00.0.0.0.0]  BM[0110..10.00..10.01..011..111...0.1.0..0..0...0.1101...0..0000.0...11.000...010.110.011]
18677
18678    7263:  !(FREE)
18679    RESETPROCDAT:
18680            P0,     BUSDIN←EMIT-[I],                         !RESET PROC UCON
18681                    EN-CLK-IR[15-00],                        !
18682            NEXT,   J/BUTD-IS-ZERO                           !AND GO TEST D<15:00>
     (7263)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...011.100.001]
18683
18684
18685
18686
18687
18688    !.PAGE==========================================================================================================
18689
18690
18691    .TOC   *     SUBR FOR LOADING FPS<3:0> [VIA BUTA(DIAGNOSE)]
18692
18693    !
18694    !       THIS SUBROUTINE LOADS CSP(16)<3:0> -> FPS<3:0> VIA THE BUTA(DIAGNOSE) FUNCTION.
18695    !
18696    !       REQUIREMENTS FOR ENTRY:
18697    !
```

```
18698    !              (1)  LOADING SR MUST BE SETUP
18699    !              (2)  CSP(16) SETUP WITH BITS TO LOAD
18700    !              (3)  CSP(00) CONTAINS RETURN MICROADDRESS IN BITS<14:03>
18701    !
18702
18703    7264:  !(FREE)
18704    LOADFPSCC:
18705           P2-T,   SR←ALL-ONES,                          !SET BIT<00> FOR JAMUPP EXPECTED
18706           P3,     BUTA(DIAGNOSE),                       !START THE XFR TO BM SEQUENCE
18707           NEXT,   J/LOADFPSCC02                         !
     (7264)  DCS[0.00.0.0.0.0]  BM[1111..00.00..11.01..101..000...0.0.1..0..0...0.0000...0..0000.0...11.011...010.110.101]
18708
18709    7265:  !(FREE)
18710    LOADFPSCC02:
18711           NEXT,   XFR-TO-BM[LOADNZW4]                   !LOAD PAGE, POINT UPF AT BM CODE
     (7265)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.100...011.011.000]
18712
18713    !LOADNZW4:                                           !(THIS WORD ACTUALLY COMES OUT OF BM ROMS)
18714    !      P2-T,   D←CSPB(16),                           !PUT "MD" = CSP(16) INTO D
18715    !      NEXT,   J/LOADNZW5                            !
18716    !
18717    !LOADNZW5:
18718    !      P2,     FPS[CC]←D[3-0],                       !LOAD FPS<3:0>
18719    !      P3,     BUTA(DIAGNOSE),                       !BEGIN XFR SEQUENCE BACK TO DCS ROMS
18720    !      NEXT,   J/NZERO2                              !
18721    !
18722    !NZERO2:
18723    !      NEXT,   GOTO-PAGE(4),                         !
18724    !              J/XXXXXX                              !
18725    !
18726    !(CONTROL NOW RETURNS TO DCS AT "JAMUPP001" WORD)
18727    !4777:
18728    !JAMUPP001:
18729    !      *** SEE FLOWS ON SUBSEQUENT PAGE ***
18730
18731
18732
18733
18734
18735    !.PAGE=========================================================================================================================
18736
18737
18738    .TOC   *     SUBR TO COPY D-REGISTER TO DBUF TO IR
18739
18740    !
18741    !      SUBROUTINE TO COPY D-REGISTER TO DBUF TO IR
18742    !              AND LEAVE PROCESSOR UCON "CLK IR" AND "BUSDIN←EMIT" ACTIVE
18743    !
18744
18745
18746    7266:  !(FREE)
18747    SRINTOIR:
18748           P2-T,   D←SR, SAVE-D[C],                      !COPY SR TO D
```

```
18749            NEXT,   J/DINTOIR                                  !
     (7266)  DCS[0.00.0.0.0.0]  BM[1111..00.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.110.111]
18750
18751     7267:  !(FREE)
18752     DINTOIR:
18753            P2-U,   IR←DBUF-[1],                               !JUST HAPPENS - DON'T CARE
18754            P3-U,   DBUF←D-[1],                                !TRANSFER D -> DBUF
18755            NEXT,   J/DBUFINTOIR                               !
     (7267)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...010.111.000]
18756
18757     7270:  !(FREE)
18758     DBUFINTOIR:
18759            EMITC,  EMIT/125200,                               !JUNK ON EMIT:  INSTR5/E88/405 PATTERN
18760            P2-U,   IR←DBUF,                                   !TRANSFER DBUF -> BUSDIN -> IR
18761            P3-U,   DBUF←D,                                    !JUST HAPPENS - DON'T CARE
18762            NEXT,   J/RESETUCONP                               !
     (7270)  DCS[0.00.0.0.0.0]  BM[1010..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...010.111.001]
18763
18764     7271:  !(FREE)
18765     RESETUCONP:
18766            SELECT, UCON-PROC,                                 !RESET TO PROCESSOR UCON:
18767            ENABLE, EN-CLK-IR[15-00],                          !  ENABLE CLOCKING IR
18768                    BUSDIN←EMIT[15-00],                        !  PUT EMIT ONTO BUSDIN
18769            PO,     SET-UCON-CONTROL,                          !WRITE CONTROLS
18770            NEXT,   BUTA(RETURN),                              !RETURN TO CALLER
18771                    J/BUTERROR7                                !FATAL ERROR IF GO HERE
     (7271)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.111...011.111.110]
18772
18773
18774     !  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
18775
18776     7272:  !(FREE)
18777     SRINTOIR5:
18778            P2-T,   D←SR, SAVE-D[C],                           !COPY SR TO D
18779            NEXT,   J/DINTOIR5                                 !
     (7272)  DCS[0.00.0.0.0.0]  BM[1111..00.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.000...010.111.011]
18780
18781     7273:  !(FREE)
18782     DINTOIR5:
18783            P2-U,   IR←DBUF-[1],                               !JUST HAPPENS - DON'T CARE
18784            P3-U,   DBUF←D-[1],                                !TRANSFER D -> DBUF
18785            NEXT,   J/DBUFINTOIR5                              !
     (7273)  DCS[0.00.0.0.0.0]  BM[0100..00.00..00.01..000..100...0.0.0..0..0...1.1011...0..0000.0...11.000...010.111.100]
18786
18787     7274:  !(FREE)
18788     DBUFINTOIR5:
18789            EMITC,  EMIT/125200,                               !JUNK ON EMIT:  INSTR5/E88/405 PATTERN
18790            P2-U,   IR←DBUF,                                   !TRANSFER DBUF -> BUSDIN -> IR
18791            P3-U,   DBUF←D,                                    !JUST HAPPENS - DON'T CARE
18792            NEXT,   J/RESETUCONP5                              !
     (7274)  DCS[0.00.0.0.0.0]  BM[1010..00.10..10.10..000..000...0.0.0..0..0...1.1010...0..0000.0...11.000...010.111.101]
18793
18794     7275:  !(FREE)
18795     RESETUCONP5:
```

```
18796            SELECT, UCON-PROC,                              !RESET TO PROCESSOR UCON:
18797            ENABLE, EN-CLK-IR[15-00],                       !  ENABLE CLOCKING IR
18798                    BUSDIN←EMIT[15-00],                     !  PUT EMIT ONTO BUSDIN
18799            PO,     SET-UCON-CONTROL,                       !WRITE CONTROLS
18800            NEXT,   J/BUTINSTR5                             !AND EXIT TO DO INSTR-5 BUT INTO TARGET AREA
     (7275)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.01..000..100...0.0.0..0..0...1.1001...0..0000.0...11.000...011.000.0011]
18801
18802
18803
18804
18805
18806
18807    !.PAGE=============================================================================================================
18808
18809
18810    .TOC   *     JAM UPP SERVICE SUBROUTINE
18811
18812    !
18813    !       IF A JAMUPP TO 0777/4777 OCCURS, ACTION DEPENDS UPON SR<00> CONTENTS:
18814    !
18815    !               SR<00>=1 -> RESET SR TO (000000), DO A BUTA[RETURN] TO ADDRESS IN CSP(00)
18816    !
18817    !               SR<00>=0 -> SIGNAL ERROR, LOG STATUS, RETURN VIA "CUA" CONTENTS
18818    !                       ERROR-CODE ::= INDICATES LAST TEST EXECUTED
18819    !
18820
18821    4777:
18822    JAMUPP001:
18823            P3-T,   SR←D                                    !SAVE CURRENT D CONTENTS IN SR
18824            NEXT,   BUTR[SR00],                             !TEST SR<00> FLAG  (PREV SR00 CONTENTS)
18825                    !IF SR<00>=1, EXPECTED JAM, GOTO "JAMUPP002B"
18826                    !IF SR<00>=0, NO JAM WAS EXPECTED, FORCE ERROR AT "JAMUPP003"
18827                    J/JAMUPP003                             !
     (4777)  DCS[0.00.0.0.0.0]  BM[1111..00.00..01.01..000..000...1.0.1..0..0...0.0000...0..0000.0...00.000...111.101.110]
18828
18829    4757:
18830    JAMUPP002B:
18831            P2-T,   D←CSPD(000), SAVE-D[C],                 !GET RETURN ADDRESS
18832            NEXT,   J/JAMUPP002C                            !
     (4757)  DCS[0.00.0.0.0.0]  BM[1010..10.00..00.00..000..111...0.1.0..0..0...0.1111...0..0000.0...11.000...100.011.100]
18833
18834    4434:  !(FREE)
18835    JAMUPP002C:
18836            PO,     RETURN←D[14-03], PAGE(7),               !PUT RETURN ADDRESS INTO REG
18837            P2-T,   D←SR, SAVE-D[C],                        !RESTORE OLD D
18838            NEXT,   J/JAMUPP002D                            !
     (4434)  DCS[0.00.0.0.0.0]  BM[1111..00.00..00.00..000..111...0.1.0..0..0...0.0000...0..0000.0...11.101...010.001.011]
18839
18840    7213:  !(FREE)
18841    JAMUPP002D:
18842            P2-T,   SR←ZERO,                                !ZERO OUT SR FOR RETURN
18843            NEXT,   BUTA(RETURN),                           !NOW RETURN
18844                    J/BUTERROR7                             !ERROR IF GO HERE
```

```
      (7213)  DCS[0.00.0.0.0.0]  BM[0011..00.00..00.00..000..000...0.0.1..0..0...0.0000...0..0000.0...11.111...011.111.110]
18845
18846    4756:
18847    JAMUPP003:
18848           SELECT, BUSDIN←CUA-[I],                          !ENABLE READ JAMUPP MICROADDR
18849           NEXT,   BUTD[ERROR],                             !WAS ERROR PREVIOUSLY SET ?
18850                   J/JAMUPP005                              !  YES/JAMUPP004, NO/JAMUPP005
      (4756)  DCS[0.00.0.1.0.0]  BM[0000..00.00..01.01..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...111.100.111]
18851
18852    !* ENTER HERE IF "ERROR" WAS PREVIOUSLY SET (INHIBIT LOG)
18853    4746:
18854    JAMUPP004:
18855           P3,     CSPD[00]←LOG-CUA,                        !GET RETURN LOC <- SAVED CUA
18856           P3-T,   BUTA(CUA-TRACK),                         !START CUA GOING AGAIN
18857           NEXT,   J/JAMUPP002B                             !INHIBIT LOG IF PREV ERROR
      (4746)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...1.0.0..0..0...0.1111...1..0000.0...11.001...111.101.111]
18858
18859    !* ENTER HERE IF "ERROR" NOT YET SET (LOG FIRST MODE)
18860    4747:
18861    JAMUPP005:
18862           P0,     DCS-CTR(C0,),                            !FORCE ERROR WITH PREV ERROR-CODE/ENUA, TNUA=(4747)
18863           P3,     CSPD[00]←LOG-CUA,                        !RETURN LOC <- RETURN ADDR FROM CUA
18864           NEXT,   J/JAMUPP006                              !AND GO LOG REGISTERS THIS TIME
      (4747)  DCS[0.00.1.0.0.0]  BM[1111..10.00..00.00..000..000...0.0.0..0..0...0.1111...1..0000.0...11.000...100.011.101]
18865
18866    4435:  !(FREE)
18867    JAMUPP006:
18868           SELECT, BUSDIN←SERVICE-[I],                      !SERVICE REGISTER
18869           NEXT,   J/JAMUPP007                              !
      (4435)  DCS[0.00.0.0.0.0]  BM[0100..01.00..00.00..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...100.011.110]
18870
18871    4436:  !(FREE)
18872    JAMUPP007:
18873           P3,     CSPD[01]←LOG-SERVICE,                    !LOG SERVICE INFO REGISTER
18874           NEXT,   J/JAMUPP010                              !
      (4436)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1110...1..0000.0...11.000...100.011.111]
18875
18876    4437:  !(FREE)
18877    JAMUPP010:
18878           SELECT, BUSDIN←JAM-[I],                          !JAM REGISTER
18879           NEXT,   J/JAMUPP011                              !
      (4437)  DCS[0.00.0.0.0.0]  BM[1100..00.00..00.00..000..000...0.0.0..0..0...1.1001...0..0000.0...11.000...100.100.000]
18880
18881    4440:  !(FREE)
18882    JAMUPP011:
18883           P3,     CSPD[02]←LOG-JAM,                        !LOG JAMUPP CAUSE INFO
18884                   BUTA(CUA-TRACK),                         !RESET CUA TO TRACK, IN CASE ANOTHER JAM COMES
18885           NEXT,   J/JAMUPP002B                             !GO TO TOP OF THIS PAGE, AND RETURN INLINE
      (4440)  DCS[0.00.0.0.0.0]  BM[0000..10.00..00.00..000..000...0.0.0..0..0...0.1101...1..0000.0...11.001...111.101.111]
18886
18887
18888
18889
18890
```

```
18891     !.PAGE=========================================================================================================================
18892
18893
18894     .TOC   *   MICROBRANCH [BUT] TAKEOFF WORDS
18895
18896     !*************************************************************************************
18897     !*                                                                                   *
18898     !*                                          UWORDS: 000 + 056                        *
18899     !*                                                                                   *
18900     !*     FUNCTION:        THESE WORDS ARE THE INACTIVE-"BUT" [BRANCHING TYPE]          *
18901     !*                      "TAKEOFF" OR SUBROUTINE MICROWORDS.  ANY TEST WHICH          *
18902     !*                      REQUIRES A SPECIFIC "BUT" CONDITION TO BE TESTED WILL USE    *
18903     !*                      ONE OF THESE MICROWORDS AS A TAKEOFF POINT INTO THE "BUT     *
18904     !*                      TARGET TABLE" [DESCRIBED NEXT], WHERE AN ENUA:TNUA           *
18905     !*                      COMPARISON WILL HAVE BEEN PREVIOUSLY ENABLED [VIA SET-       *
18906     !*                      TING THE DIAGNOSTIC COUNTER TO THE APPROPRIATE VALUE.        *
18907     !*                                                                                   *
18908     !*************************************************************************************
18909
18910
18911
18912
18913     !*** BUT 00 ***
18914     !FULL WIDTH IS BUT[SR<3:0>]
18915     7276:  !(FREE)
18916     BUTSR3-0:
18917           NEXT,   BUT(SR3-0),                                  !TO (400)-(417), W4
18918                   J/ZTARGET400                                 !NO MASK
     (7276)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.000...100.000.000]
18919
18920
18921     !*** BUT 01 ***
18922     !FULL WIDTH IS BUT[IR<15:12>]
18923     7300:  !(FREE)
18924     BUTIR15-12:
18925           NEXT,   BUT(IR15-12),                                !TO (400)-(417), W4
18926                   J/ZTARGET400                                 !NO MASK
     (7300)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.001...100.000.000]
18927
18928
18929     !*** BUT 02 ***
18930     !FULL WIDTH IS BUT[INSTR 5]
18931     7301:  !(FREE)
18932     BUTINSTR5:
18933           NEXT,   BUT(INSTR5),                                 !TO (400)-(437), W5
18934                   J/ZTARGET400                                 !NO MASK
     (7301)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.010...100.000.000]
18935
18936
18937     !*** BUT 03 ***
18938     !FULL WIDTH IS BUT[IR11#FLTPT<3:0>]
18939     7302:  !(FREE)
18940     BUTIR11FLTPT3-0:
18941           NEXT,   BUT(IR11#FLTPT3-0),                          !TO (400)-(437), W5
```

```
18942                   J/ZTARGET400                                    !NO MASK
     (7302)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.011...100.000.000]
18943
18944
18945     !*** BUT 04 ***
18946     !FULL WIDTH IS BUT[IR<9:6>]
18947     7304:  !(FREE)
18948     BUTIR9-6:
18949             NEXT,   BUT(IR9-6),                                     !TO (400)-(417), W4
18950                     J/ZTARGET400                                    !NO MASK
     (7304)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.100...100.000.000]
18951
18952
18953     !*** BUT 05 ***
18954     !FULL WIDTH IS BUT[MOV-DR7#IR<5:3>]
18955     7305:  !(FREE)
18956     BUTMOVDR7IR5-3:
18957             NEXT,   BUT(MOV-DR7#IR5-3),                             !TO (400)-(417), W4
18958                     J/ZTARGET400                                    !NO MASK
     (7305)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.101...100.000.000]
18959
18960
18961     !*** BUT 06 ***
18962     !FULL WIDTH IS BUT[INSTR 1]          *** N.B.:  THIS BUT IS ALSO ACTIVE ***
18963     7306:  !(FREE)
18964     BUTINSTR1:
18965             NEXT,   BUTA(INSTR1),                                   !TO (400)-(777), W8
18966                     J/ZTARGET400                                    !NO MASK
     (7306)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.110...100.000.000]
18967
18968
18969     !*** BUT 07 ***
18970     !FULL WIDTH IS BUT[BG-SERV-H+FP-SERV-H#D[C]#FPRET<1:0>]
18971     7307:  !(FREE)
18972     BUTBGFPSERV:
18973             NEXT,   BUT(BGSERV-FPSERV#D[C]#FPRET),                  !TO (407),(417), W1
18974                     J/ZTARGET407                                    !MASK OUT D[C], FPRET<1:0>
     (7307)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.111...100.000.111]
18975
18976     7310:  !(FREE)
18977     BUTD[C]C:
18978             NEXT,   BUT(BGSERV-FPSERV#D[C]#FPRET),                  !TO (413),(417), W1
18979                     J/ZTARGET413                                    !MASK OUT BG-SERV-H+FP-SERV-H, FPRET<1:0>
     (7310)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...00.111...100.001.011]
18980
18981
18982     !*** BUT10 ***
18983     !FULL WIDTH IS BUT[COUT07#DOUT07#FPS05]
18984     7311:  !(FREE)
18985     BUTCOUT7DOUT7:
18986             NEXT,   BUT(COUT07#DOUT07#FPS05),                       !TO (401),(403),(405),(407), W2
18987                     J/ZTARGET401                                    !MASK OUT FPS05
     (7311)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.000...100.000.001]
18988
```

```
18989     7312:  !(FREE)
18990     BUTFPS05:
18991           NEXT,   BUT(COUT07#DOUT07#FPS05),          !TO (406),(407), W1
18992                   J/ZTARGET406                       !MASK OUT COUT7, DOUT7
      (7312)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.000...100.000.110]
18993
18994
18995     !*** BUT 11 ***
18996     !FULL WIDTH IS BUT[DMO#SMO#BYTE]
18997     7313:  !(FREE)
18998     BUTDMSMBYTE:
18999           NEXT,   BUT(DMO#SMO#BYTE),                 !TO (400)-(407), W3
19000                   J/ZTARGET400                       !NO MASK
      (7313)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.001...100.000.000]
19001
19002
19003     !*** BUT 12 ***
19004     !FULL WIDTH IS BUT[GD<3:2>]
19005     7314:  !(FREE)
19006     BUTGD3-2:
19007           NEXT,   BUT(GD3-2),                        !TO (400)-(403), W2
19008                   J/ZTARGET400                       !NO MASK
      (7314)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.010...100.000.000]
19009
19010
19011     !*** BUT 13 ***
19012     !FULL WIDTH IS BUT[SR<1:0>#COUNT-IS-377]           *** N.B.:  THIS BUT IS ALSO ACTIVE  ***
19013     7315:  !(FREE)
19014     BUTSR1-0:
19015           NEXT,   BUTA(SR1-0#COUNT-IS-377),          !TO (401),(403),(405),(407), W2
19016                   J/ZTARGET401                       !MASK OUT COUNT-IS-377
      (7315)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.011...100.000.001]
19017
19018
19019     !*** BUT 14 ***
19020     !FULL WIDTH IS BUT[BG-SERVCE-L#MFSS#MULTIPLE]
19021     7316:  !(FREE)
19022     BUTBGSERVL:
19023           NEXT,   BUT(BG-SERVCE-L#MFSS#MULTIPLE),    !TO (403),(407), W1
19024                   J/ZTARGET403                       !MASK OUT MFSS, MULTIPLE
      (7316)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.011]
19025
19026     7317:  !(FREE)
19027     BUTMMASKPS[T]:
19028           SETUP,  TEST(MASKED-PS[T]),                !SELECT MULTIPLE BUT
19029           NEXT,   J/BUTMNXT000                       !NEXT
      (7317)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.000]
19030
19031     7320:  !(FREE)
19032     BUTMNXT000:
19033           SETUP,  TEST(MASKED-PS[T]),                !SELECT MULTIPLE BUT
19034           NEXT,   BUT(BG-SERVCE-L#MFSS#MULTIPLE),    !TO (406),(407), W1
19035                   J/ZTARGET406                       !MASK OUT BG-SERVCE-L, MFSS
      (7320)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]
```

```
19036
19037     7321:  !(FREE)
19038     BUTMD00:
19039           SETUP,  TEST(D00),                                  !SELECT MULTIPLE BUT
19040           NEXT,   J/BUTMNXT001                                !NEXT
     (7321)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..001...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.010]
19041
19042     7322:  !(FREE)
19043     BUTMNXT001:
19044           SETUP,  TEST(D00),                                  !SELECT MULTIPLE BUT
19045           NEXT,   BUT(BG-SERVCE-L&MFSS&MULTIPLE),             !TO (406),(407), W1
19046                   J/ZTARGET406                                !MASK OUT BG-SERVCE-L, MFSS
     (7322)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..001...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]
19047
19048     7323:  !(FREE)
19049     BUTMPS[N]:
19050           SETUP,  TEST(PS[N]),                                !SELECT MULTIPLE BUT
19051           NEXT,   J/BUTMNXT002                                !NEXT
     (7323)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..010...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.100]
19052
19053     7324:  !(FREE)
19054     BUTMNXT002:
19055           SETUP,  TEST(PS[N]),                                !SELECT MULTIPLE BUT
19056           NEXT,   BUT(BG-SERVCE-L&MFSS&MULTIPLE),             !TO (406),(407), W1
19057                   J/ZTARGET406                                !MASK OUT BG-SERVCE-L, MFSS
     (7324)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..010...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]
19058
19059     7325:  !(FREE)
19060     BUTMFLAG7:
19061           SETUP,  TEST(FLAG7),                                !SELECT MULTIPLE BUT
19062           NEXT,   J/BUTMNXT003                                !NEXT
     (7325)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..011...0.0.0..0..0...0.0000...0..0000.0...11.000...011.010.110]
19063
19064     7326:  !(FREE)
19065     BUTMNXT003:
19066           SETUP,  TEST(FLAG7),                                !SELECT MULTIPLE BUT
19067           NEXT,   BUT(BG-SERVCE-L&MFSS&MULTIPLE),             !TO (406),(407), W1
19068                   J/ZTARGET406                                !MASK OUT BG-SERVCE-L, MFSS
     (7326)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..011...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]
19069
19070     7327:  !(FREE)
19071     BUTMEXFLAG1:
19072           SETUP,  TEST(EXFLAG1),                              !SELECT MULTIPLE BUT
19073           NEXT,   J/BUTMNXT004                                !NEXT
     (7327)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.000]
19074
19075     7330:  !(FREE)
19076     BUTMNXT004:
19077           SETUP,  TEST(EXFLAG1),                              !SELECT MULTIPLE BUT
19078           NEXT,   BUT(BG-SERVCE-L&MFSS&MULTIPLE),             !TO (406),(407), W1
19079                   J/ZTARGET406                                !MASK OUT BG-SERVCE-L, MFSS
     (7330)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..100...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]
19080
19081     7331:  !(FREE)
```

```
19082    BUTMFLTPTS:
19083            SETUP,  TEST(FLTPTS),                          !SELECT MULTIPLE BUT
19084            NEXT,   J/BUTMNXT005                           !NEXT
     (7331)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..101...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.010]
19085
19086    7332:  !(FREE)
19087    BUTMNXT005:
19088            SETUP,  TEST(FLTPTS),                          !SELECT MULTIPLE BUT
19089            NEXT,   BUT(BG-SERVCE-L#MFSS#MULTIPLE),        !TO (406),(407), W1
19090                    J/ZTARGET406                           !MASK OUT BG-SERVCE-L, MFSS
     (7332)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..101...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]
19091
19092    7333:  !(FREE)
19093    BUTMEXFLAG2:
19094            SETUP,  TEST(EXFLAG2),                         !SELECT MULTIPLE BUT
19095            NEXT,   J/BUTMNXT006                           !NEXT
     (7333)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...11.000...011.011.100]
19096
19097    7334:  !(FREE)
19098    BUTMNXT006:
19099            SETUP,  TEST(EXFLAG2),                         !SELECT MULTIPLE BUT
19100            NEXT,   BUT(BG-SERVCE-L#MFSS#MULTIPLE),        !TO (406),(407), W1
19101                    J/ZTARGET406                           !MASK OUT BG-SERVCE-L, MFSS
     (7334)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..110...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]
19102
19103
19104    7336:  !(FREE)
19105    BUTMINITJAM:
19106            SETUP,  TEST(INIT-JAM),                        !SELECT MULTIPLE BUT
19107            NEXT,   J/BUTMNXT007                           !NEXT
     (7336)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..111...0.0.0..0..0...0.0000...0..0000.0...11.000...011.100.000]
19108
19109    7340:  !(FREE)
19110    BUTMNXT007:
19111            SETUP,  TEST(INIT-JAM),                        !SELECT MULTIPLE BUT
19112            NEXT,   BUT(BG-SERVCE-L#MFSS#MULTIPLE),        !TO (406),(407), W1
19113                    J/ZTARGET406                           !MASK OUT BG-SERVCE-L, MFSS
     (7340)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..111...0.0.0..0..0...0.0000...0..0000.0...01.100...100.000.110]
19114
19115    !*** BUT 15 ***
19116    !FULL WIDTH IS BUT[D<14:00>=0#D15]
19117    7341:  !(FREE)
19118    BUTD-IS-ZERO:
19119            NEXT,   BUT(D14-00EQ0#D15),                    !TO (400)-(403),W2
19120                    J/ZTARGET400                           !NO MASK
     (7341)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.101...100.000.000]
19121
19122
19123    !*** BUT 16 ***
19124    !FULL WIDTH IS BUT[IR11#PS15]
19125    7342:  !(FREE)
19126    BUTIR11B:
19127            NEXT,   BUT(IR11#PS15),                        !TO (401),(403), W1
19128                    J/ZTARGET401                           !MASK OUT PS15
```

```
      (7342)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.110...100.000.001]
19129
19130    7343:  !(FREE)
19131    BUTPS15:
19132          NEXT,   BUT(IR11#PS15),                          !TO (402),(403), W1
19133                  J/ZTARGET402                             !MASK OUT IR11
      (7343)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.110...100.000.010]
19134
19135
19136    !*** BUT 17 ***
19137    !FULL WIDTH IS BUT[COUNT-IS-377#D[C]]          *** N.B.:  THIS BUT IS ALSO ACTIVE  ***
19138    7344:  !(FREE)
19139    BUTD[C]A:
19140          NEXT,   BUTA(COUNT-IS-377#D[C]),                 !TO (402),(403), W1
19141                  J/ZTARGET402                             !MASK OUT COUNT-IS-377
      (7344)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...01.111...100.000.010]
19142
19143
19144    !*** BUT 20 ***
19145    !FULL WIDTH IS BUT[PREFETCH-L#SERVICE]          *** N.B.:  THIS BUT IS ALSO ACTIVE ***
19146    7345:  !(FREE)
19147    BUTSERVICE:
19148          NEXT,   BUTA(PREFETCH-L#SERVICE),                !TO (402),(403), W1
19149                  J/ZTARGET402                             !MASK OUT PREFETCH-L
      (7345)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.000...100.000.010]
19150
19151
19152    !*** BUT 21 ***
19153    !FULL WIDTH IS BUT[VECTOR-LOAD#DR6/7L]
19154    7346:  !(FREE)
19155    BUTVECTLOAD:
19156          NEXT,   BUT(VECTOR-LOAD#DR6-7L),                 !TO (401), (403), W1
19157                  J/ZTARGET401                             !MASK OUT DR6/7-L
      (7346)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.001...100.000.001]
19158
19159    7347:  !(FREE)
19160    BUTDR6-7L:
19161          NEXT,   BUT(VECTOR-LOAD#DR6-7L),                 !TO (402), (403), W1
19162                  J/ZTARGET402                             !MASK OUT VECTOR-LOAD
      (7347)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.001...100.000.010]
19163
19164
19165    !*** BUT 22 ***
19166    !THIS IS AN ACTIVE BUT - NO BRANCH MODIFICATION
19167    !(THIS BUT IS NOT USED WITH THE TARGET TABLE)
19168
19169
19170    !*** BUT 23 ***
19171    !FULL WIDTH IS BUT[D[C]#BA00]
19172    7350:  !(FREE)
19173    BUTD[C]B:
19174          NEXT,   BUT(D[C]#BA00),                          !TO (401),(403), W1
19175                  J/ZTARGET401                             !MASK OUT BA00
      (7350)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.011...100.000.001]
```

```
19176
19177    7351:  !(FREE)
19178    BUTBA00:
19179           NEXT,   BUT(D[C]#BA00),                          !TO (402),(403), W1
19180                   J/ZTARGET402                             !MASK OUT D[C]
     (7351)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.011...100.000.010]
19181
19182
19183    !*** BUT 24 ***
19184    !FULL WIDTH IS BUT[OTHER-JAM#FP-PROC]
19185    7352:  !(FREE)
19186    BUTOTHERJAM:
19187           NEXT,   BUT(OTHER-JAM#FP-PROC),                  !TO (401),(403), W1
19188                   J/ZTARGET401                             !MASK OUT FLTPT-PROC-H
     (7352)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.100...100.000.001]
19189
19190    7354:  !(FREE)
19191    BUTFPPROC:
19192           NEXT,   BUT(OTHER-JAM#FP-PROC),                  !TO (402),(403), W1
19193                   J/ZTARGET402                             !MASK OUT OTHER-JAM
     (7354)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.100...100.000.010]
19194
19195
19196    !*** BUT 25 ***
19197    !FULL WIDTH IS BUT[COUNT-IS-377]                 *** N.B.:  THIS BUT IS ALSO ACTIVE ***
19198    !(THIS BUT IS NOT USED WITH THE TARGET TABLE)
19199
19200
19201    !*** BUT 26 ***
19202    !FULL WIDTH IS BUT[INTR-HIGH#INSTR-BRANCH-L]
19203    7355:  !(FREE)
19204    BUTINTRHIGH:
19205           NEXT,   BUT(INTR-HIGH#INSTR-BRANCH-L),           !TO (401),(403), W1
19206                   J/ZTARGET401                             !MASK OUT INSTR-BRANCH-L
     (7355)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.110...100.000.001]
19207
19208    7356:  !(FREE)
19209    BUTINSTRBRANCH:
19210           NEXT,   BUT(INTR-HIGH#INSTR-BRANCH-L),           !TO (402),(403), W1
19211                   J/ZTARGET402                             !MASK OUT INTR-HIGH-H
     (7356)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.110...100.000.010]
19212
19213
19214    !*** BUT 27 ***
19215    !FULL WIDTH IS BUT[PREFETCH-JAM#FP-FD]
19216    7360:  !(FREE)
19217    BUTPREFETCHJAM:
19218           NEXT,   BUT(PREFETCH-JAM#FP-FD),                 !TO (401),(403), W1
19219                   J/ZTARGET401                             !MASK OUT FLTPT-FD-H
     (7360)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.111...100.000.001]
19220
19221    7371:  !(FREE)
19222    BUTFPFD:
19223           NEXT,   BUT(PREFETCH-JAM#FP-FD),                 !TO (402),(403), W1
```

```
19224                   J/ZTARGET402                                    !MASK OUT PREFETCH-JAM-H
      (7371)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...10.111...100.000.010]
19225
19226
19227
19228
19229
19230    !.PAGE=============================================================================================================
19231
19232
19233    .TOC   *   MICROBRANCH [BUT] TARGET WORDS
19234
19235    !*****************************************************************************************
19236    !*                                                                                       *
19237    !*                                          UWORDS: 000 + 400                            *
19238    !*                                                                                       *
19239    !*     FUNCTION:        TARGET BUT TABLE                                                 *
19240    !*                      ALL THE ABOVE BUTS TARGET INTO THIS TABLE OF MICROWORDS,         *
19241    !*                      ALL OF WHICH DO A BUTA(RETURN).  IN THIS MANNER, ANY OF          *
19242    !*                      THE ABOVE BRANCHES MAY BE EXECUTED, AND CONTROL WILL ALWAYS      *
19243    !*                      RETURN TO WHERE THE "BUT TES" SUBROUTINE WAS CALLED.             *
19244    !*                                                                                       *
19245    !*****************************************************************************************
19246
19247
19248
19249    !*** THE TARGET BUT TABLE ***
19250
19251       7400:
19252       ZTARGET400:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7400)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19253       7401:
19254       ZTARGET401:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7401)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19255       7402:
19256       ZTARGET402:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7402)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19257       7403:
19258       ZTARGET403:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7403)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19259       7404:
19260       ZTARGET404:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7404)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19261       7405:
19262       ZTARGET405:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7405)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19263       7406:
19264       ZTARGET406:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7406)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19265       7407:
19266       ZTARGET407:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7407)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19267       7410:
19268       ZTARGET410:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
        (7410)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19269     7411:
19270     ZTARGET411:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7411)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19271     7412:
19272     ZTARGET412:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7412)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19273     7413:
19274     ZTARGET413:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7413)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19275     7414:
19276     ZTARGET414:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7414)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19277     7415:
19278     ZTARGET415:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7415)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19279     7416:
19280     ZTARGET416:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7416)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19281     7417:
19282     ZTARGET417:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7417)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19283     7420:
19284     ZTARGET420:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7420)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19285     7421:
19286     ZTARGET421:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7421)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19287     7422:
19288     ZTARGET422:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7422)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19289     7423:
19290     ZTARGET423:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7423)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19291     7424:
19292     ZTARGET424:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7424)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19293     7425:
19294     ZTARGET425:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7425)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19295     7426:
19296     ZTARGET426:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7426)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19297     7427:
19298     ZTARGET427:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7427)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19299     7430:
19300     ZTARGET430:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7430)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19301     7431:
19302     ZTARGET431:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7431)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19303     7432:
19304     ZTARGET432:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
      (7432)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19305    7433:
19306    ZTARGET433:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7433)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19307    7434:
19308    ZTARGET434:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7434)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19309    7435:
19310    ZTARGET435:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7435)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19311    7436:
19312    ZTARGET436:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7436)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19313    7437:
19314    ZTARGET437:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7437)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19315    7440:
19316    ZTARGET440:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7440)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19317    7441:
19318    ZTARGET441:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7441)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19319    7442:
19320    ZTARGET442:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7442)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19321    7443:
19322    ZTARGET443:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7443)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19323    7444:
19324    ZTARGET444:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7444)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19325    7445:
19326    ZTARGET445:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7445)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19327    7446:
19328    ZTARGET446:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7446)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19329    7447:
19330    ZTARGET447:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7447)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19331    7450:
19332    ZTARGET450:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7450)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19333    7451:
19334    ZTARGET451:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7451)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19335    7452:
19336    ZTARGET452:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7452)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19337    7453:
19338    ZTARGET453:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7453)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19339    7454:
19340    ZTARGET454:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
      (7454)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19341    7455:
19342    ZTARGET455:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7455)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19343    7456:
19344    ZTARGET456:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7456)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19345    7457:
19346    ZTARGET457:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7457)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19347    7460:
19348    ZTARGET460:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7460)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19349    7461:
19350    ZTARGET461:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7461)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19351    7462:
19352    ZTARGET462:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7462)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19353    7463:
19354    ZTARGET463:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7463)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19355    7464:
19356    ZTARGET464:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7464)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19357    7465:
19358    ZTARGET465:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7465)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19359    7466:
19360    ZTARGET466:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7466)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19361    7467:
19362    ZTARGET467:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7467)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19363    7470:
19364    ZTARGET470:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7470)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19365    7471:
19366    ZTARGET471:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7471)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19367    7472:
19368    ZTARGET472:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7472)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19369    7473:
19370    ZTARGET473:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7473)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19371    7474:
19372    ZTARGET474:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7474)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19373    7475:
19374    ZTARGET475:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7475)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19375    7476:
19376    ZTARGET476:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
      (7476)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19377    7477:
19378    ZTARGET477:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7477)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19379    7500:
19380    ZTARGET500:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7500)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19381    7501:
19382    ZTARGET501:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7501)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19383    7502:
19384    ZTARGET502:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7502)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19385    7503:
19386    ZTARGET503:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7503)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19387    7504:
19388    ZTARGET504:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7504)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19389    7505:
19390    ZTARGET505:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7505)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19391    7506:
19392    ZTARGET506:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7506)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19393    7507:
19394    ZTARGET507:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7507)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19395    7510:
19396    ZTARGET510:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7510)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19397    7511:
19398    ZTARGET511:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7511)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19399    7512:
19400    ZTARGET512:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7512)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19401    7513:
19402    ZTARGET513:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7513)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19403    7514:
19404    ZTARGET514:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7514)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19405    7515:
19406    ZTARGET515:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7515)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19407    7516:
19408    ZTARGET516:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7516)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19409    7517:
19410    ZTARGET517:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7517)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19411    7520:
19412    ZTARGET520:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
      (7520)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19413    7521:
19414    ZTARGET521:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7521)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19415    7522:
19416    ZTARGET522:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7522)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19417    7523:
19418    ZTARGET523:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7523)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19419    7524:
19420    ZTARGET524:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7524)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19421    7525:
19422    ZTARGET525:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7525)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19423    7526:
19424    ZTARGET526:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7526)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19425    7527:
19426    ZTARGET527:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7527)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19427    7530:
19428    ZTARGET530:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7530)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19429    7531:
19430    ZTARGET531:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7531)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19431    7532:
19432    ZTARGET532:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7532)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19433    7533:
19434    ZTARGET533:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7533)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19435    7534:
19436    ZTARGET534:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7534)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19437    7535:
19438    ZTARGET535:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7535)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19439    7536:
19440    ZTARGET536:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7536)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19441    7537:
19442    ZTARGET537:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7537)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19443    7540:
19444    ZTARGET540:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7540)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19445    7541:
19446    ZTARGET541:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7541)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19447    7542:
19448    ZTARGET542:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
        (7542)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19449     7543:
19450     ZTARGET543:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7543)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19451     7544:
19452     ZTARGET544:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7544)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19453     7545:
19454     ZTARGET545:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7545)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19455     7546:
19456     ZTARGET546:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7546)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19457     7547:
19458     ZTARGET547:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7547)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19459     7550:
19460     ZTARGET550:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7550)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19461     7551:
19462     ZTARGET551:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7551)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19463     7552:
19464     ZTARGET552:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7552)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19465     7553:
19466     ZTARGET553:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7553)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19467     7554:
19468     ZTARGET554:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7554)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19469     7555:
19470     ZTARGET555:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7555)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19471     7556:
19472     ZTARGET556:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7556)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19473     7557:
19474     ZTARGET557:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7557)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19475     7560:
19476     ZTARGET560:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7560)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19477     7561:
19478     ZTARGET561:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7561)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19479     7562:
19480     ZTARGET562:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7562)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19481     7563:
19482     ZTARGET563:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7563)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19483     7564:
19484     ZTARGET564:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
      (7564)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19485    7565:
19486    ZTARGET565:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7565)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19487    7566:
19488    ZTARGET566:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7566)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19489    7567:
19490    ZTARGET567:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7567)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19491    7570:
19492    ZTARGET570:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7570)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19493    7571:
19494    ZTARGET571:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7571)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19495    7572:
19496    ZTARGET572:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7572)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19497    7573:
19498    ZTARGET573:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7573)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19499    7574:
19500    ZTARGET574:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7574)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19501    7575:
19502    ZTARGET575:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7575)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19503    7576:
19504    ZTARGET576:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7576)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19505    7577:
19506    ZTARGET577:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7577)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19507    7600:
19508    ZTARGET600:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7600)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19509    7601:
19510    ZTARGET601:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7601)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19511    7602:
19512    ZTARGET602:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7602)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19513    7603:
19514    ZTARGET603:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7603)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19515    7604:
19516    ZTARGET604:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7604)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19517    7605:
19518    ZTARGET605:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7605)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19519    7606:
19520    ZTARGET606:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
        (7606)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19521       7607:
19522       ZTARGET607:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7607)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19523       7610:
19524       ZTARGET610:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7610)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19525       7611:
19526       ZTARGET611:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7611)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19527       7612:
19528       ZTARGET612:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7612)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19529       7613:
19530       ZTARGET613:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7613)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19531       7614:
19532       ZTARGET614:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7614)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19533       7615:
19534       ZTARGET615:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7615)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19535       7616:
19536       ZTARGET616:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7616)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19537       7617:
19538       ZTARGET617:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7617)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19539       7620:
19540       ZTARGET620:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7620)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19541       7621:
19542       ZTARGET621:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7621)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19543       7622:
19544       ZTARGET622:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7622)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19545       7623:
19546       ZTARGET623:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7623)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19547       7624:
19548       ZTARGET624:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7624)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19549       7625:
19550       ZTARGET625:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7625)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19551       7626:
19552       ZTARGET626:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7626)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19553       7627:
19554       ZTARGET627:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7627)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19555       7630:
19556       ZTARGET630:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
        (7630)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19557      7631:
19558      ZTARGET631:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7631)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19559      7632:
19560      ZTARGET632:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7632)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19561      7633:
19562      ZTARGET633:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7633)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19563      7634:
19564      ZTARGET634:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7634)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19565      7635:
19566      ZTARGET635:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7635)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19567      7636:
19568      ZTARGET636:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7636)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19569      7637:
19570      ZTARGET637:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7637)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19571      7640:
19572      ZTARGET640:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7640)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19573      7641:
19574      ZTARGET641:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7641)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19575      7642:
19576      ZTARGET642:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7642)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19577      7643:
19578      ZTARGET643:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7643)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19579      7644:
19580      ZTARGET644:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7644)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19581      7645:
19582      ZTARGET645:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7645)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19583      7646:
19584      ZTARGET646:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7646)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19585      7647:
19586      ZTARGET647:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7647)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19587      7650:
19588      ZTARGET650:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7650)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19589      7651:
19590      ZTARGET651:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7651)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19591      7652:
19592      ZTARGET652:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
        (7652)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19593     7653:
19594     ZTARGET653:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7653)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19595     7654:
19596     ZTARGET654:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7654)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19597     7655:
19598     ZTARGET655:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7655)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19599     7656:
19600     ZTARGET656:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7656)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19601     7657:
19602     ZTARGET657:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7657)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19603     7660:
19604     ZTARGET660:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7660)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19605     7661:
19606     ZTARGET661:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7661)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19607     7662:
19608     ZTARGET662:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7662)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19609     7663:
19610     ZTARGET663:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7663)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19611     7664:
19612     ZTARGET664:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7664)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19613     7665:
19614     ZTARGET665:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7665)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19615     7666:
19616     ZTARGET666:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7666)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19617     7667:
19618     ZTARGET667:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7667)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19619     7670:
19620     ZTARGET670:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7670)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19621     7671:
19622     ZTARGET671:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7671)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19623     7672:
19624     ZTARGET672:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7672)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19625     7673:
19626     ZTARGET673:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7673)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19627     7674:
19628     ZTARGET674:     NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
        (7674)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19629     7675:
19630     ZTARGET675:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7675)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19631     7676:
19632     ZTARGET676:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7676)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19633     7677:
19634     ZTARGET677:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7677)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19635     7700:
19636     ZTARGET700:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7700)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19637     7701:
19638     ZTARGET701:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7701)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19639     7702:
19640     ZTARGET702:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7702)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19641     7703:
19642     ZTARGET703:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7703)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19643     7704:
19644     ZTARGET704:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7704)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19645     7705:
19646     ZTARGET705:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7705)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19647     7706:
19648     ZTARGET706:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7706)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19649     7707:
19650     ZTARGET707:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7707)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19651     7710:
19652     ZTARGET710:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7710)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19653     7711:
19654     ZTARGET711:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7711)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19655     7712:
19656     ZTARGET712:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7712)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19657     7713:
19658     ZTARGET713:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7713)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19659     7714:
19660     ZTARGET714:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7714)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19661     7715:
19662     ZTARGET715:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7715)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19663     7716:
19664     ZTARGET716:    NEXT,    BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
      (7716)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19665    7717:
19666    ZTARGET717:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7717)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19667    7720:
19668    ZTARGET720:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7720)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19669    7721:
19670    ZTARGET721:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7721)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19671    7722:
19672    ZTARGET722:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7722)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19673    7723:
19674    ZTARGET723:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7723)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19675    7724:
19676    ZTARGET724:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7724)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19677    7725:
19678    ZTARGET725:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7725)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19679    7726:
19680    ZTARGET726:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7726)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19681    7727:
19682    ZTARGET727:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7727)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19683    7730:
19684    ZTARGET730:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7730)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19685    7731:
19686    ZTARGET731:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7731)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19687    7732:
19688    ZTARGET732:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7732)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19689    7733:
19690    ZTARGET733:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7733)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19691    7734:
19692    ZTARGET734:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7734)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19693    7735:
19694    ZTARGET735:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7735)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19695    7736:
19696    ZTARGET736:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7736)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19697    7737:
19698    ZTARGET737:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7737)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19699    7740:
19700    ZTARGET740:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
        (7740)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19701     7741:
19702     ZTARGET741:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7741)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19703     7742:
19704     ZTARGET742:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7742)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19705     7743:
19706     ZTARGET743:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7743)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19707     7744:
19708     ZTARGET744:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7744)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19709     7745:
19710     ZTARGET745:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7745)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19711     7746:
19712     ZTARGET746:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7746)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19713     7747:
19714     ZTARGET747:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7747)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19715     7750:
19716     ZTARGET750:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7750)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19717     7751:
19718     ZTARGET751:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7751)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19719     7752:
19720     ZTARGET752:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7752)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19721     7753:
19722     ZTARGET753:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7753)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19723     7754:
19724     ZTARGET754:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7754)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19725     7755:
19726     ZTARGET755:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7755)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19727     7756:
19728     ZTARGET756:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7756)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19729     7757:
19730     ZTARGET757:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7757)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19731     7760:
19732     ZTARGET760:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7760)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19733     7761:
19734     ZTARGET761:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
        (7761)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19735     7762:
19736     ZTARGET762:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
```

```
      (7762)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19737    7763:
19738    ZTARGET763:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7763)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19739    7764:
19740    ZTARGET764:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7764)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19741    7765:
19742    ZTARGET765:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7765)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19743    7766:
19744    ZTARGET766:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7766)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19745    7767:
19746    ZTARGET767:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7767)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19747    7770:
19748    ZTARGET770:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7770)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19749    7771:
19750    ZTARGET771:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7771)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19751    7772:
19752    ZTARGET772:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7772)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19753    7773:
19754    ZTARGET773:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7773)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19755    7774:
19756    ZTARGET774:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7774)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19757    7775:
19758    ZTARGET775:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7775)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19759    7776:
19760    ZTARGET776:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7776)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19761    7777:
19762    ZTARGET777:    NEXT,   BUTA(RETURN), J/BUTERROR7       !COMPARE MICROADDRESS, THEN RETURN
      (7777)  DCS[0.00.0.0.0.0]  BM[0000..00.00..00.00..000..000...0.0.0..0..0...0.0000...0..0000.0...11.111...011.111.110]
19763
19764
19765    !*****************************************************************************************
19766    .TOC   * END OF KD11-K MICRODIAGNOSTIC CODE
19767    !*****************************************************************************************
19768
19769    .END
```

```
4000  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4040  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4100  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4140  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4200  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4240  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4300  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4340  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4400  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1
4440  1 0 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4500  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4540  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4600  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4640  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4700  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4740  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1
5000  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5040  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5100  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5140  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5200  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5240  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5300  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5340  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5400  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5440  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 0 0 0 1 1 1 1 1 1 1 1 1 1
5500  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 0 1 1 1 1 1 1 1 1 1 1 1
5540  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5600  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5640  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5700  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5740  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6000  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6040  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6100  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6140  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6200  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6240  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6300  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6340  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6400  1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6440  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6500  1 1 1 1 1 1 1 0 1 1 1 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1
6540  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6600  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6640  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6700  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6740  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7000  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7040  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7100  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7140  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7200  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
```

```
7240  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0
7300  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7340  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 0
7400  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7440  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7500  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7540  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7600  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7640  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7700  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
7740  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
```

K07

LINE	LOCN	SYMBOL
8399	7025	AGAINSRD350
5946	4610	ALU115A1
6242	4634	ALU116A1
6502	4666	ALU117A1
6752	4072	ALU120B1
7068	4121	ALU121D1
8058	7020	ALUCARRY2
14323	7141	AR7-537A
7450	4150	ARITH131B1
11048	6525	ASSERTFOV500
17504	7204	BDX05
14305	7134	BR3-537A
16342	4311	BUSFCN711A
16863	7201	BUSFCN721A
17257	4346	BUSFCN730D
17563	4371	BUSFCN740A
19178	7351	BUTBADD
14517	7136	BUTCOUNT-IS-377
19160	7347	BUTDR6-7L
2880	4376	BUTERROR4
19222	7371	BUTFPFD
18964	7306	BUTINSTR1
19126	7342	BUTIR11B
19038	7321	BUTMDDD
19082	7331	BUTMFLTPTS
19043	7322	BUTMNXT001
19087	7332	BUTMNXT005
19049	7323	BUTMPS[N]
19147	7345	BUTSERVICE
10540	7062	BYTE37SA
17497	7203	C17X12
18600	7247	CJESERVICETOD
15878	7165	CLEAR624
18470	7232	CLEARI004
18674	7262	CMPPROCOAT
7408	4145	COMP131A1
8479	4246	COMP350C
8620	4261	COMP351C
8721	4271	COMP352C
8976	6015	COMP362B
9302	6047	COMP366C
10797	6106	COMP410A
10925	6123	COMP410E
11178	6144	COMP500E
13664	6362	COMP534B
13824	6402	COMP534F
14039	6426	COMP536B
14215	6446	COMP536F
17342	4354	COMP731A
14592	4526	COUNTER03
14631	4535	COUNTER07
14670	4533	COUNTER10A
14400	7155	AL1-537A
6028	4015	ALU11581
6333	4040	ALU1168
6577	4057	ALU1178
6839	4706	ALU121A1
7155	4672	ALU122A1
8067	7021	ALUCARRY2A
7290	4540	ARITH130A1
7509	4522	ARITH132A1
15612	5413	BC1FCN622A
17492	7177	BDX12
14329	7142	BR7-537A
16480	4316	BUSFCN712A
16974	4324	BUSFCN722A
17328	4764	BUSFCN731A
17598	4373	BUSFCN740B
18972	7307	BUTBGFPSERV
18985	7311	BUTCOUT7DOUT7
19139	7344	BUTDIC1A
2886	5376	BUTERROR5
19191	7354	BUTFPPROC
18932	7301	BUTINSTR5
18940	7302	BUTIR11FLTPT3-0
19071	7327	BUTMEXFLAG1
19105	7336	BUTMINITJAM
19054	7324	BUTMNXT002
19098	7334	BUTMNXT006
19186	7352	BUTOTHERJAM
19014	7315	BUTSR1-0
10745	7070	BYTEFIRST410
10547	7063	CHECK37SA
18454	7227	CLEAR-I-0-A
16278	6470	CLEAR7100
18476	7233	CLEARI005
15618	5414	CNST0622A
7459	4151	COMP131B1
8506	4250	COMP3500
8641	4263	COMP351D
8742	4273	COMP352D
9051	6022	COMP363A
9386	6057	COMP370A
10827	6111	COMP410B
11078	6134	COMP500A
13548	6350	COMP533A
13704	6365	COMP534C
13906	6411	COMP535A
14082	6431	COMP536C
14422	4302	COMP537A
17409	4361	COMP731C
14603	4545	COUNTER04
14641	4536	COUNTER08
14676	4531	COUNTER10B
18075	4731	ALLOW763A
6111	4622	ALU115C1
6366	4646	ALU116C1
6640	4063	ALU117C1
6913	4107	ALU121B1
8041	7007	ALUCARRY1
14347	7145	AR11-537A
7341	4140	ARITH130B1
7554	4157	ARITH132B1
15269	5570	BCERC622A
14407	4242	BLI-537A
17885	4551	BUMP076?A
16608	7167	BUSFCN713A
17101	4331	BUSFCN730A
17370	4356	BUSFCN731B
17627	4374	BUSFCN740C
19022	7316	BUTBGSERVL
19118	7341	BUTD-IS-ZERO
19173	7350	BUTDIC1B
2892	6376	BUTERROR6
18990	7312	BUTFPSOS
19209	7356	BUTINSTRBRANCH
18924	7300	BUTIR15-12
19093	7333	BUTMEXFLAG2
19027	7317	BUTMRRSKPS[T]
19065	7326	BUTMNXT003
19110	7340	BUTMNXT007
19217	7360	BUTPREFETCHJAM
18916	7276	BUTSR3-0
10764	7367	BYTESECOND410
10570	5300	CHECK375B
18459	7230	CLEAR-I-0-B
17747	4404	CLEAR761A
18638	7255	CLRJAMTOD
7299	4135	COMP130A1
8424	4702	COMP350A
8576	4704	COMP351A
8677	4714	COMP352A
8860	6004	COMP361B
9174	6034	COMP365A
9447	6064	COMP370C
10861	6115	COMP410C
11114	6137	COMP500C
13589	6354	COMP533B
13738	6370	COMP534D
13946	6415	COMP535B
14129	6436	COMP536D
15580	5412	COMP621H
14579	4301	COUNTER01
14612	4557	COUNTER05
14652	4525	COUNTER09
14683	4547	COUNTER11
5887	4003	ALU114A
6171	4026	ALU115D1
6459	4050	ALU116D
6692	4664	ALU120A1
6994	4670	ALU121C1
8050	7017	ALUCARRY1A
14298	6451	AR3-537A
7399	4520	ARITH131A1
10856	6114	ASIDE410C
15641	5416	BCERC622B
14353	7146	BR11-537A
16180	4313	BUSFCN710A
16758	7176	BUSFCN720A
17161	4337	BUSFCN730B
17440	4364	BUSFCN731D
17660	4401	BUSFCN740D
11873	6217	BUTCLRSOSA
18998	7313	BUTDMSMBYTE
18977	7310	BUTDIC1C
2898	7376	BUTERROR7
19006	7314	BUTGD3-2
19204	7355	BUTINTRHIGH
18948	7304	BUTIR9-6
19060	7325	BUTMFLAG7
19032	7320	BUTMNXT000
19076	7330	BUTMNXT004
18956	7305	BUTMOVDR7IRS-3
19131	7343	BUTPS15
19155	7346	BUTVECTLOAD
17509	7205	C17X05
12293	6254	CINS07F
12106	6236	CLEARSO6E
18464	7231	CLEARI002
18585	7244	CLRSERVICETOD
7350	4141	COMP130B1
8451	4244	COMP350B
8598	4257	COMP351B
8699	4267	COMP352B
8943	6012	COMP362A
9242	6042	COMP366A
9517	6072	COMP371A
10893	6120	COMP410D
11143	6141	COMP500D
13630	6357	COMP534A
13785	6374	COMP534E
13998	6422	COMP536A
14175	6442	COMP536E
17116	4333	COMP730A
14584	4310	COUNTER02
14621	4534	COUNTER06
14663	4527	COUNTER10
14690	4555	COUNTER12

L07

LINE	LOCN	SYMBOL
13851	6404	COUNTERS34G
9574	7035	CSP16XORFLTTOIRS
9678	5555	CUA372B
18518	7235	D1512A
18788	7274	DBUFINTOIRS
18782	7273	DINTOIRS
18422	7224	DISP004
10718	6531	DNONZERO410
12009	7072	DOIT506A
14953	5336	DOIT610B2
15163	5363	DOIT610D2
7944	4212	DOPA136A1
10019	5237	DOWRITE374B2
10165	5256	DOWRITE374D2
10311	5274	DOWRITE374F2
18558	7243	DTOIR8
18538	7240	D[05-00]
18230	4431	EOP001
18256	7211	EOP005
14371	7151	ER3-537A
8853	6003	EXPEC361B
9295	6046	EXPEC366C
10133	5567	EXPEC374D1
10822	6110	EXPEC410B
11108	6136	EXPEC500C
11599	6175	EXPEC504A
12151	6602	EXPEC507A
14026	6424	EXPEC536B
15688	5421	EXPEC623
16052	5437	EXPEC702A
16381	6473	EXPEC711B
16697	6504	EXPEC713D
17953	4414	FILL762C
12571	7075	FLAGFPS02
18619	7252	FLAGFPST0D
16474	4314	GENADR712A
15852	5431	GETCUA624C
8176	4227	GETDC320C
14907	5330	GETIT610B1
15133	5360	GETIT610D1
17376	4357	GETIT731B
15665	5420	GETJAM622C
9934	5226	GETTEM374A1
10080	5244	GETTEM374C1
10226	5263	GETTEM374E1
5894	4004	GETZEROES114A
3116	5006	GOBUT012D
3220	5013	GOBUT013A
3299	5017	GOBUT013E
3403	5024	GOBUT014B
3508	5031	GOBUT015B
3635	5037	GOBUT017B

LINE	LOCN	SYMBOL
14359	7147	CR11-537A
9568	7031	CSP16XORSRTOIR5
18650	7257	CUAT0D
18590	7245	DATISERVICETOD
17958	4415	DELAY762C
8408	4563	DINTOIRA350
18428	7225	DISP005
11282	6153	DOFCC503A
14785	5313	DOIT610A1
15016	5344	DOIT610C1
7613	4163	DOPA133A1
9926	5225	DOWRITE374A1
10072	5243	DOWRITE374C1
10218	5262	DOWRITE374E1
14365	7150	DR11-537A
17836	4411	DWIIL762A
18524	7236	D[11-06]
18237	6452	EOP002
18265	6776	EOP006
2827	6543	ERROR010
8969	6014	EXPEC362B
9914	5222	EXPEC374A1
10206	5515	EXPEC374E1
10851	6113	EXPEC410C
11171	6143	EXPEC500E
11723	6206	EXPEC504E
13893	6407	EXPEC535A
14116	6434	EXPEC536D
15846	5430	EXPEC624C
16096	6460	EXPEC702B
16411	6475	EXPEC711C
17156	4336	EXPEC730B
10526	7046	FIRST375A
12577	7076	FLAGFPS03
14382	7152	FR3-537A
5954	4010	GETALTN115A1
17109	43-2	GETDBUF730A
8237	4234	GETDC320E
14962	5337	GETIT610B2
15172	5364	GETIT610D2
17853	7210	GETIT762A
18662	7260	GETMSKPROCDAT
9954	5231	GETTEM374A2
10100	5250	GETTEM374C2
10246	5266	GETTEM374E2
3056	5003	GOBUT012A
3135	5007	GOBUT012E
3242	5014	GOBUT013B
3320	5020	GOBUT013F
3422	5025	GOBUT014C
3527	5032	GOBUT015C
3677	5041	GOBUT020A

LINE	LOCN	SYMBOL
14311	7137	CR3-537A
15352	5372	CSP1L621A
18543	7241	DOSOOA
18595	7246	DATOSERVICETOD
18752	7267	DINTOIR
18410	7222	DISP002
18434	7226	DISP006
11611	6177	DOFCC504A
14835	5321	DOIT610A2
15067	5352	DOIT610C2
7725	4173	DOPA134A1
9946	5230	DOWRITE374A2
10092	5247	DOWRITE374C2
10238	5265	DOWRITE374E2
14317	7140	DR3-537A
18552	7242	DZERO
18511	7234	D[15-12]
18243	6510	EOP003
18275	6512	EOP007
15426	5615	ERROR621A
9167	6033	EXPEC365A
9987	5537	EXPEC374B1
10279	5527	EXPEC374F1
10886	6117	EXPEC410D
11262	6150	EXPEC503A
11860	6215	EXPEC505A
13934	6413	EXPEC535B
15502	5405	EXPEC621E
15939	7166	EXPEC701A
16243	6465	EXPEC710C
16562	6501	EXPEC712D
18013	4417	EXPEC762E
11056	6527	FIXPAT500
12582	7077	FLAGFPS04
11992	6231	FUDGEPS506A
15535	5410	GETCUA621F
17335	4353	GETDBUF731A
14794	5314	GETIT610A1
15025	5345	GETIT610C1
17169	4340	GETIT730B
15324	5371	GETJAM620C
5881	4600	GETONES114A
10007	5235	GETTEM374B1
10153	5254	GETTEM374D1
10299	5272	GETTEM374F1
3077	5004	GOBUT012B
3155	5010	GOBUT012F
3261	5015	GOBUT013C
3339	5021	GOBUT013G
3444	5026	GOBUT014D
3570	5034	GOBUT016A
3697	5042	GOBUT020B

LINE	LOCN	SYMBOL
14335	7143	CR7-537A
9627	6222	CUA372A
18529	7237	D1106A
18758	7270	DBUFINTOIR
8359	7353	DINTOIR350
18416	7223	DISP003
18404	7221	DISPLAY
10603	5440	DOIT376A
14838	5327	DOIT610B1
15124	5357	DOIT610D1
7838	4203	DOPA135A1
9999	5234	DOWRITE374B1
10145	5253	DOWRITE374D1
10291	5271	DOWRITE374F1
14341	7144	DR7-537A
10728	6533	DZERO410
12452	6270	ENFLAGS10D
18250	6511	EOP004
18282	7212	EOP010
15803	6567	ERROR624A
9236	6041	EXPEC366A
10060	5557	EXPEC374C1
10785	7363	EXPEC410A
10918	6122	EXPEC410E
11414	6163	EXPEC503E
11959	6612	EXPEC506A
13986	6420	EXPEC536A
15528	5407	EXPEC621F
15988	6455	EXPEC701C
16272	6467	EXPEC710D
16648	5452	EXPEC713B
18069	4422	EXPEC763A
12446	6267	FLAGS10D
12566	7073	FLAGFPSSEQL0D
12177	6244	FUDGEPS507A
15695	5422	GETCUA623
8118	4225	GETDC320A
14844	5322	GETIT610A2
15076	5353	GETIT610C2
17265	4347	GETIT730D
15508	5405	GETJAM621E
18657	7373	GETPROCDAT
10027	5240	GETTEM374B2
10173	5257	GETTEM374D2
10319	5275	GETTEM374F2
3097	5005	GOBUT012C
3177	5011	GOBUT012G
3280	5016	GOBUT013D
3382	5023	GOBUT014A
3488	5030	GOBUT015A
3613	5036	GOBUT017A
3719	5043	GOBUT020C

LINE	LOCN	SYMBOL
3762	5045	GOBUT021A
3892	5053	GOBUT023A
4045	5062	GOBUT026A
4174	5070	GOBUT030C
4304	5076	GOBUT032A
4457	5105	GOBUT035A
4611	5114	GOBUT040B
4739	5122	GOBUT042B
4893	5131	GOBUT045A
5027	5137	GOBUT047B
5626	5210	GOBUT105A1
5959	4011	GOBUT115A1
6036	4016	GOBUT115B1
6119	4023	GOBUT115C1
6194	4030	GOBUT115D2
6279	4035	GOBUT116A3
6374	4043	GOBUT116C1
6436	4047	GOBUT116C5
6542	4055	GOBUT117A3
6617	4062	GOBUT117B3
6715	4070	GOBUT120A2
6792	4075	GOBUT120B3
6878	4105	GOBUT121A3
6953	4112	GOBUT121B3
7033	4117	GOBUT121C3
7108	4124	GOBUT121D3
7195	4131	GOBUT122A3
7357	4142	GOBUT130B1
7466	4152	GOBUT131B1
7563	4160	GOBUT132B1
7750	4175	GOBUT134A2
7969	4214	GOBUT136A2
8184	4230	GOBUT320C
8429	4243	GOBUT350A
8581	4256	GOBUT351A
8682	4266	GOBUT352A
8880	6005	GOBUT361D
9017	6017	GOBUT362E
9131	6030	GOBUT364B
9391	6060	GOBUT370A
9522	6073	GOBUT371A
10575	5301	GOBUT375B
10930	6124	GOBUT410E
11184	6145	GOBUT500E
11393	6162	GOBUT503D
11482	6167	GOBUT503H
11636	6201	GOBUT504A
11749	6210	GOBUT504F
11899	6221	GOBUT505B
12062	6234	GOBUT506C
12208	6247	GOBUT507B
12328	6261	GOBUT507F

LINE	LOCN	SYMBOL
3783	5046	GOBUT021B
3936	5055	GOBUT024A
4089	5064	GOBUT027A
4197	5071	GOBUT030D
4325	5077	GOBUT032B
4502	5107	GOBUT036A
4654	5116	GOBUT041A
4783	5124	GOBUT043A
4935	5133	GOBUT046A
5047	5140	GOBUT047C
5674	5213	GOBUT105B1
5991	4013	GOBUT115A2
6068	4020	GOBUT115B2
6134	4024	GOBUT115C2
6211	4031	GOBUT115D3
6296	4036	GOBUT116A4
6389	4044	GOBUT116C2
6466	4051	GOBUT116D
6557	4056	GOBUT117A4
6647	4064	GOBUT117C1
6732	4071	GOBUT120A3
6807	4076	GOBUT120B4
6893	4106	GOBUT121A4
6968	4113	GOBUT121B4
7048	4120	GOBUT121C4
7123	4125	GOBUT121D4
7215	4133	GOBUT122A4
7372	4143	GOBUT130B2
7481	4153	GOBUT131B2
7579	4161	GOBUT132B2
7798	4200	GOBUT134B2
8017	4217	GOBUT136B2
8204	4231	GOBUT320D
8456	4245	GOBUT350B
8603	4260	GOBUT351B
8704	4270	GOBUT352B
8902	6006	GOBUT361E
9056	6023	GOBUT363A
9194	6035	GOBUT365B
9412	6061	GOBUT370B
9545	6074	GOBUT371B
10626	5303	GOBUT376A
11084	6135	GOBUT500A
11306	6155	GOBUT503A
11366	6160	GOBUT503DA
11502	6170	GOBUT503I
11654	6202	GOBUT504B
11770	6211	GOBUT504G
11919	6223	GOBUT505C
12083	6235	GOBUT506D
12229	6250	GOBUT507C
12381	6264	GOBUT510A

LINE	LOCN	SYMBOL
3805	5047	GOBUT021C
3957	5056	GOBUT024B
4132	5066	GOBUT030A
4240	5073	GOBUT031A
4370	5101	GOBUT033A
4546	5111	GOBUT037A
4676	5117	GOBUT041B
4804	5125	GOBUT043B
4958	5134	GOBUT046B
5093	5142	GOBUT050A
5899	4005	GOBUT114A
6008	4014	GOBUT115A3
6085	4021	GOBUT115B3
6151	4025	GOBUT115C3
6250	4033	GOBUT116A1
6312	4037	GOBUT116A5
6404	4045	GOBUT116C3
6510	4053	GOBUT117A1
6585	4060	GOBUT117B1
6662	4065	GOBUT117C2
6760	4073	GOBUT120B1
6847	4103	GOBUT121A1
6921	4110	GOBUT121B1
7002	4115	GOBUT121C1
7076	4122	GOBUT121D1
7163	4127	GOBUT122A1
7306	4136	GOBUT130A1
7415	4146	GOBUT131A1
7518	4155	GOBUT132A1
7638	4165	GOBUT133A2
7863	4205	GOBUT135A2
8125	4223	GOBUT320A
8244	4235	GOBUT320E
8484	4247	GOBUT350C
8625	4262	GOBUT351C
8726	4272	GOBUT352C
8949	6013	GOBUT362A
9076	6024	GOBUT363B
9263	6043	GOBUT366B
9452	6065	GOBUT370C
9821	6101	GOBUT373B
10866	6116	GOBUT410C
11121	6140	GOBUT500C
11325	6156	GOBUT503B
11440	6165	GOBUT503F
11520	6171	GOBUT503J
11675	6203	GOBUT504C
11791	6212	GOBUT504H
12022	7071	GOBUT506A
12112	6237	GOBUT506E
12250	6251	GOBUT507D
12403	6265	GOBUT510B

LINE	LOCN	SYMBOL
3848	5051	GOBUT022A
4001	5060	GOBUT025A
4155	5067	GOBUT030B
4261	5074	GOBUT031B
4414	5103	GOBUT034A
4589	5113	GOBUT040A
4718	5121	GOBUT042A
4848	5127	GOBUT044A
5004	5136	GOBUT047A
5122	5144	GOBUT050B
5913	4006	GOBUT114A2
5975	4012	GOBUT115A4
6052	4017	GOBUT115B4
6179	4027	GOBUT115D1
6264	4034	GOBUT116A2
6340	4041	GOBUT116B
6420	4046	GOBUT116C4
6525	4054	GOBUT117A2
6600	4061	GOBUT117B2
6700	4067	GOBUT120A1
6775	4074	GOBUT120B2
6862	4104	GOBUT121A2
6936	4111	GOBUT121B2
7017	4116	GOBUT121C2
7091	4123	GOBUT121D2
7179	4130	GOBUT122A2
7321	4137	GOBUT130A2
7430	4147	GOBUT131A2
7534	4156	GOBUT132A2
7685	4170	GOBUT133B2
7911	4210	GOBUT135B2
8146	4224	GOBUT320B
8263	4236	GOBUT320F
8512	4251	GOBUT350D
8647	4264	GOBUT351D
8748	4274	GOBUT352D
8996	6016	GOBUT362D
9104	6026	GOBUT364A
9345	6053	GOBUT367B
9474	6066	GOBUT370D
10552	7064	GOBUT375A
10898	6121	GOBUT410D
11149	6142	GOBUT500D
11346	6157	GOBUT503C
11461	6166	GOBUT503G
11539	6172	GOBUT503K
11702	6205	GOBUT504D
11811	6213	GOBUT504I
12041	6233	GOBUT506B
12189	6246	GOBUT507A
12273	6253	GOBUT507E
12425	6266	GOBUT510C

LINE	LOCN	SYMBOL
12462	6272	GOBUT510D
13555	6351	GOBUT533A
13711	6366	GOBUT534C
13856	6405	GOBUT534G
14046	6427	GOBUT5368
14222	6447	GOBUT536F
15447	5402	GOBUT621B
15586	7160	GOBUT621H
15969	5434	GOBUT701B
17127	4335	GOBUT730A
17270	4350	GOBUT730D
17414	4362	GOBUT731C
17605	4766	GOBUT7408
17773	4406	GOBUT761B
18038	4421	GOBUT762F
10773	7361	GOFORM410
11421	6164	GOPUTS03E
5173	5147	GOTEST101A
5342	5164	GOTEST102D
5488	5201	GOTEST103D
5654	5212	GOTEST105B
7619	4164	GOTEST133A1
7844	4204	GOTEST135A1
9967	5232	GOTEST374A2
10259	5267	GOTEST374E2
12783	7111	GOTESTS11A3
12839	7117	GOTESTS11B3
13100	6315	GOTESTS1281
13204	6325	GOTESTS12D1
13346	6335	GOTESTS20A
13460	6345	GOTESTS20E
14552	5626	GOTESTS51C
16113	6463	GOTEST7028
16301	6472	GOTEST710E
16519	5450	GOTEST7128
16796	6506	GOTEST720B
17012	4325	GOTEST722B
13535	6666	INIT533A
14110	6433	INIT536D
13658	6361	INITD534B
13817	6401	INITD534F
14033	6425	INITD536B
14209	6445	INITD536F
2948	7004	INITIALIZE05
2977	4102	INITIALIZE11
18378	7217	INSERT03
10802	6107	INTOIR410A
18835	4434	JAMUPP002C
18861	4747	JAMUPP005
18882	4440	JAMUPP011
12944	7124	KTSRCDST03
12973	7337	KTSRCDST06

LINE	LOCN	SYMBOL
12483	6273	GOBUT510DA
13595	6355	GOBUT533B
13745	6371	GOBUT534D
13912	6412	GOBUT535A
14089	6432	GOBUT536C
14428	4303	GOBUT537A
15465	5403	GOBUT621C
15623	5415	GOBUT622A
16018	5435	GOBUT701D
17175	4341	GOBUT730B
17293	4351	GOBUT730E
17452	4366	GOBUT731D
17633	4375	GOBUT740C
17793	4407	GOBUT761C
18115	4425	GOBUT763B
18019	4420	GOGET762E
11630	6200	GOPUTS04A
5263	5156	GOTEST102A
5409	5173	GOTEST103A
5528	5203	GOTEST104A
5702	5215	GOTEST105C
7669	4167	GOTEST133B1
7894	4207	GOTEST135B1
10040	5241	GOTEST374B2
10332	5276	GOTEST374F2
12794	7113	GOTESTS11A4
12850	7121	GOTESTS11B4
13115	6316	GOTESTS12B2
13219	6326	GOTESTS12D2
13374	6337	GOTESTS20B
14487	4564	GOTESTS51A
15949	7171	GOTEST701A
16219	6464	GOTEST710B
16387	6474	GOTEST711B
16567	6502	GOTEST712D
16820	4317	GOTEST720C
17036	4326	GOTEST722C
13576	6352	INIT5338
13542	6347	INITD533A
13698	6662	INITD534C
13899	6410	INITD535A
14075	6652	INITD536C
2931	6532	INITIALIZE01
2953	7005	INITIALIZE06
2988	4001	INITIALIZE12
18384	7220	INSERT04
18643	7256	JAMTOD
18841	7213	JAMUPP002D
18867	4435	JAMUPP006
18176	4763	KILL764A
12951	7125	KTSRCDST04
12981	7127	KTSRCDST07

LINE	LOCN	SYMBOL
12509	6275	GOBUT510E
13636	6360	GOBUT534A
13791	6375	GOBUT534E
13952	6416	GOBUT535B
14135	6437	GOBUT536D
15275	5366	GOBUT620A
15483	5404	GOBUT621D
15646	5417	GOBUT622B
16537	6500	GOBUT712C
17196	4342	GOBUT730C
17347	4355	GOBUT731A
17474	4367	GOBUT731E
17667	4767	GOBUT740D
17932	4762	GOBUT762B
18136	4426	GOBUT763C
10832	6112	GOPUT410B
11730	6207	GOPUTS04E
5289	5160	GOTEST102B
5435	5175	GOTEST103B
5555	5205	GOTEST104B
5729	5217	GOTEST105D
7731	4174	GOTEST134A1
7950	4213	GOTEST136A1
10113	5251	GOTEST374C2
12761	6550	GOTESTS11A1
12817	6554	GOTESTS11B1
13045	6311	GOTESTS12A1
13149	6321	GOTESTS12C1
13253	6331	GOTESTS12E1
13403	6341	GOTESTS20C
14511	4560	GOTESTS51B
15998	6457	GOTEST701C
16248	6466	GOTEST710C
16416	6476	GOTEST711C
16653	5453	GOTEST7138
16901	4321	GOTEST721B
14388	7153	GR3-537A
13887	6656	INITS35A
13582	6353	INITD5338
13732	6367	INITD534D
13940	6414	INITD5358
14122	6435	INITD536D
2937	7001	INITIALIZE03
2958	7006	INITIALIZE07
14280	7131	INITSR537A
18362	7214	INSERTEOPREVNO
18822	4777	JAMUPP001
18847	4756	JAMUPP003
18872	4436	JAMUPP007
12933	7114	KTSRCDST01
12958	7126	KTSRCDST04B
12987	7130	KTSRCDST08

LINE	LOCN	SYMBOL
12538	6277	GOBUT510F
13671	6363	GOBUT534B
13831	6403	GOBUT534F
14005	6423	GOBUT536A
14182	6443	GOBUT536E
15293	5367	GOBUT620B
15557	5411	GOBUT621G
15871	5432	GOBUT624D
16671	6503	GOBUT713C
17219	4443	GOBUT730C1
17382	4360	GOBUT731B
17572	4776	GOBUT740A
17752	4405	GOBUT761A
17987	4416	GOBUT762D
18155	4427	GOBUT763D
11300	6154	GOPUTS03A
11879	6220	GOPUTS05A
5316	5162	GOTEST102C
5462	5177	GOTEST103C
5606	5207	GOTEST105A
5750	5220	GOTEST105E
7781	4177	GOTEST134B1
8000	4216	GOTEST136B1
10186	5260	GOTEST374D2
12772	7107	GOTESTS11A2
12828	7115	GOTESTS11B2
13060	6312	GOTESTS12A2
13164	6322	GOTESTS12C2
13268	6332	GOTESTS12E2
13431	6343	GOTESTS20D
14528	7157	GOTESTS51B1
16074	5444	GOTEST702A
16284	6471	GOTEST710D
16435	6477	GOTEST711D
16702	6505	GOTEST7130
16925	4322	GOTEST721C
14394	7154	HR3-537A
13980	6654	INITS36A
13623	6664	INITD534A
13778	6373	INITD534E
13993	6421	INITD536A
14168	6441	INITD536E
2942	7003	INITIALIZE04
2965	4101	INITIALIZE10
18367	7215	INSERT02
18373	7216	INSERTREVNO
18830	4757	JAMUPP002B
18854	4746	JAMUPP004
18877	4437	JAMUPP010
12938	7123	KTSRCDST02
12967	7335	KTSRCDST05
5252	5154	LOADDD-102A

LINE	LOCN	SYMBOL
5232	5530	LOADD1-102A
14937	5333	LOADD1-610B2
2809	4100	LOADD10
3376	5746	LOADD14A
3506	5736	LOADD17A
3641	5716	LOADD23A
4038	5706	LOADD36A
4397	5656	LOADD38A
4450	5646	LOADD3EA
4502	5636	LOADD40A
4641	5626	LOADD44A
8548	4547	LOADD5-351
5116	5143	LOADD508
5263	5120	LOADD7-103A
14559	4276	LOADD14537A
5388	5171	LOADD17-103A
16170	4307	LOADDR710A
16107	6462	LOADDR7028
5311	5161	LOADD10CC
5457	5176	LOADD10CC
17096	4330	LOADDR7730A
11276	6158	LOADDCC03A
11385	6147	LOADDF03A
8384	7357	LOADDM350
11386	6161	LOADDR5030
14286	5331	LOADDR610B2
17435	4363	LOADDR731D
12375	6263	LOADDRI0510A
9224	6037	LOADDSX56A
9307	6103	LOADDSX74
16602	5464	LOADDT713A
5600	5542	LOADDR105A
8748	6002	LOADDX361A
8350	4241	LOADDX0650
13772	6540	LOADCNTRS34E
9613	6510	LOOP372A
15317	5470	MEMX620C
12686	6522	MF5001
12715	6502	MF5005
18668	7261	MEMPROCOAT
16193	4445	NEXT710A
16769	7304	NEXT720A
8376	7023	NEXTPAT350
18633	7264	OOOJAMTOD
7825	4514	OPA135A1
7719	4172	OPB134A1
18612	7251	PBATOD
14887	5305	PSCC-DC610B1
15113	5355	PSCC-DC610D1
15222	7164	PSCCTOSR3-0BB
12170	6243	PSL0507A
12601	7101	PSSEQL0002

LINE	LOCN	SYMBOL
14758	5306	LOADD1-610A1
15000	5341	LOADD1-610C1
2854	5001	LOADD11
14272	4300	LOADD1537A
5237	5151	LOADD[illegible]-102A
5345	5714	LOADD[illegible]3A
5400	5700	LOADD[illegible]7A
5453	5650	LOADD[illegible]3A
5499	5640	LOADD[illegible]9A
5546	5630	LOADD[illegible]1A
5594	5620	LOADD[illegible]5A
14764	5307	LOADD[illegible]-610A1
6814	5154	LOADD[illegible]-351
14[illegible]	5311	LOADD[illegible]7-610B2
5[illegible]	5165	LOADD[illegible]5-103A
6[illegible]	5176	LOADD[illegible]7A
15[illegible]	7128	LOADD[illegible]701A
5[illegible]	5[illegible]	LOADD[illegible]101A
5[illegible]	5[illegible]	LOADD[illegible]10D
5[illegible]	5[illegible]	LOADD[illegible]10D
172[illegible]	4[illegible]	LOADDR[illegible]730D
115[illegible]	612[illegible]	LOADDCC[illegible]3A
115[illegible]	612[illegible]	LOADDF[illegible]3A
83[illegible]	7[illegible]	LOADDM[illegible]50
116[illegible]	6[illegible]	LOADDR[illegible]040
14774	5[illegible]	LOADDR[illegible]10C1
17551	4765	LOADDR740A
8841	6001	LOADDSX61A
9332	6051	LOADDSX67A
16164	5472	LOADDT710A
16737	5462	LOADDT720A
5449	5211	LOADDR105B
9340	6053	LOADDX67A
11999	7057	LOADLCOR05A
13812	6400	LOADCNTRS4F
17[illegible]	4[illegible]	MEMX[illegible]D730D
15[illegible]	5[illegible]	MEMX[illegible]701A
12[illegible]	6[illegible]	MF5002
12[illegible]	6[illegible]	MF5006
14291	6443	NEMCNTRS37A
16[illegible]	4446	NEXT711A
16[illegible]	7[illegible]	NEXT721A
10737	7005	NEXTPAT410
7659	4166	OPA133B1
7884	4206	OPA135B1
7832	4203	OPB134A1
17847	7207	PRIO676A
14942	5334	PSCC-DC610B2
15152	5361	PSCC-DC610D2
11972	6226	PSMI506A
11979	6227	PSMI0506A
12607	7102	PSSEQL0003

LINE	LOCN	SYMBOL
14819	5316	LOADD1-610A2
15051	5347	LOADD1-610C2
2944	5[illegible]	LOADD12A
3401	5740	LOADD15A
3670	5724	LOADD[illegible]A
3938	5710	LOADD[illegible]A
4186	5700	LOADD[illegible]A
4434	5650	LOADD[illegible]A
4538	5[illegible]	LOADD37A
4711	5[illegible]	LOADD[illegible]3A
4[illegible]	5[illegible]	LOADD[illegible]6A
150[illegible]	5[illegible]	LOADD[illegible]-610C2
14769	5310	LOADD[illegible]-610A1
5[illegible]	5[illegible]	LOADD10-102A
5377	5[illegible]	LOADD1[illegible]-103A
5[illegible]	5[illegible]	LOADD[illegible]7B
15[illegible]	5[illegible]	LOADD[illegible]701C
5[illegible]	5[illegible]	LOADD[illegible]10A
5[illegible]	5[illegible]	LOADD[illegible]10A
5[illegible]	5[illegible]	LOADD[illegible]10A
12015	6104	LOADDCC[illegible]5A
11[illegible]	6[illegible]	LOADDF[illegible]03A
1874[illegible]	7[illegible]	LOADDM[illegible]CC
14476	4[illegible]	LOADDR[illegible]51A
14753	5[illegible]	LOADDR[illegible]10A1
16743	7172	LOADDR[illegible]20A
17[illegible]	4[illegible]	LOADDR[illegible]40B
8[illegible]	6011	LOADDSX[illegible]5A
8[illegible]	6[illegible]	LOADDSX[illegible]7A
16[illegible]	5[illegible]	LOADDT[illegible]711A
16[illegible]	4[illegible]	LOADDT[illegible]721A
5[illegible]	5[illegible]	LOADDR[illegible]105C
14[illegible]	5[illegible]	LOADDX[illegible]5E
15[illegible]	5[illegible]	LOADLCOR[illegible]1A
15[illegible]	5[illegible]	LOADLCOR[illegible]1A
17[illegible]	4[illegible]	MEMX[illegible]D731D
16047	5[illegible]	MEMX[illegible]72A
12[illegible]	6[illegible]	MF5003
12[illegible]	6[illegible]	MF5[illegible]XPEC0
2767	7203	NEXT1007
16492	4447	NEXT712A
16[illegible]	4[illegible]	NEXT722A
11039	6377	NEXTPAT500
7712	4512	OPA134A1
7980	4215	OPA135B1
7928	4542	OPB134A1
14774	5311	PSCC-DC610A1
15005	5342	PSCC-DC610C1
15212	7162	PSCCTOSR3-0
12157	6241	PSMI507A
12164	6242	PSMI0507A
12612	7103	PSSEQL0004

LINE	LOCN	SYMBOL
14882	5324	LOADD1-610B1
15108	5360	LOADD1-610D1
3213	5744	LOADD13A
3553	5736	LOADD16A
3754	5720	LOADD21A
3991	5704	LOADD25A
4232	5672	LOADD31A
14[illegible]	4277	LOADD3537A
5[illegible]	5152	LOADD4-102A
4775	5[illegible]	LOADD43A
4997	5[illegible]	LOADD47A
5086	5[illegible]	LOADD50A
14813	5315	LOADD6-610B2
5[illegible]	5167	LOADD13-103A
14[illegible]	4574	LOADD[illegible]37A
11[illegible]	6[illegible]	LOADD[illegible]A
16[illegible]	5[illegible]	LOADD[illegible]702A
5[illegible]	5[illegible]	LOADD[illegible]10B
5430	5174	LOADD[illegible]10B
5500	5[illegible]	LOADD[illegible]10B
12184	6[illegible]	LOADDCC[illegible]07A
11[illegible]	6[illegible]	LOADDF[illegible]504A
18710	7[illegible]	LOADDM[illegible]CC02
11017	6[illegible]	LOADDR[illegible]00
14876	5[illegible]	LOADDR[illegible]10B1
17091	4754	LOADDR730A
17647	4400	LOADDR740D
9161	6[illegible]	LOADDSX[illegible]5A
9505	6[illegible]	LOADDSX[illegible]71B
16467	5[illegible]	LOADDT[illegible]712A
16[illegible]	5[illegible]	LOADDT[illegible]722A
5723	5216	LOADDR105D
14203	6[illegible]	LOADDX[illegible]6F
15747	5[illegible]	LOADDX[illegible]4A
15731	5[illegible]	LOADLCOR[illegible]4A
11270	6151	MEMX[illegible]03A
17[illegible]	7[illegible]	MEMX[illegible]76A
12706	6504	MF5004
12742	6547	MF5[illegible]XPEC1
2833	7[illegible]	NEXT1010
16621	7[illegible]	NEXT713A
17[illegible]	4[illegible]	NEXTD762A
8536	4[illegible]	NEXTPATA350
7771	4176	OPA134B1
7607	4510	OPB133A1
9665	6100	PAGE372B
14824	5317	PSCC-DC610B2
15056	5350	PSCC-DC610C2
15217	7163	PSCCTOSR3-0AA
11985	6230	PSL0506A
12596	7100	PSSEQL00
12618	7104	PSSEQL0005

LINE	LOCN	SYMBOL
12623	7105	PSSEQL0006
8435	7062	RESETIR350A
18765	7271	RESETUCONP
8782	7033	RESTORE03
3347	5023	SCOPE013
3642	5040	SCOPE017
3978	5054	SCOPE023
4056	5065	SCOPE027
4378	5102	SCOPE033
4554	5112	SCOPE037
4811	5126	SCOPE043
5056	5141	SCOPE047
5446	5302	SCOPE103
6042	4022	SCOPE115B
6670	4066	SCOPE117C
7223	4134	SCOPE129
7693	4171	SCOPE136
8270	4237	SCOPE320
9553	6075	SCOPE371
10048	6242	SCOPE374B
10340	6277	SCOPE374F
11550	6173	SCOPE503
12338	6262	SCOPE507
13046	6313	SCOPE512D
13601	6356	SCOPE533B
13959	6417	SCOPE536B
14434	4304	SCOPE537A
15084	5354	SCOPE610C
16027	5436	SCOPE701
16576	5447	SCOPE712
17299	4352	SCOPE730
18163	4430	SCOPE763
16853	7173	SETADR721A
14780	5312	SETBUSA610A1
15011	5343	SETBUSA610C1
10673	6560	SETBYTE0410
10697	6105	SETBYTE0410
8169	4226	SETD320C
9671	5000	SETDC372B
9126	6027	SETDOC364B
10975	6676	SETFETCH0500
10998	6131	SETFETCHG500
15765	6453	SETFLG624A
13088	6536	SETIRS12B1
3039	5760	SETIRA
16969	4323	SETJAM722A
8105	4700	SETONE320A
17907	4463	SETPR6-762A
13039	6310	SETPSFLAGS12A1
13247	6330	SETPSFLAGS12E1
9216	6036	SETRES366A
14285	7135	SETRESA537A

LINE	LOCN	SYMBOL
18626	7253	PSTOO
8461	7065	RESETIR350B
18775	7275	RESETUCONP5
8788	7033	RESTORE04
3462	5027	SCOPE014
3776	5044	SCOPE020
3965	5057	SCOPE024
4204	5072	SCOPE030
4421	5104	SCOPE034
4618	5115	SCOPE040
4865	5130	SCOPE044
5123	5145	SCOPE050
5563	5306	SCOPE104
6217	4033	SCOPE115D
6813	4077	SCOPE120B
7360	4144	SCOPE130B
7806	4201	SCOPE134B
8520	4352	SCOPE350
9700	6501	SCOPE372B
10121	6252	SCOPE374C
10633	6304	SCOPE376
11820	6214	SCOPE504
12548	6300	SCOPE510
13170	6323	SCOPE512C
13677	6364	SCOPE534B
14052	6430	SCOPE536B
14559	5305	SCOPE551
15180	5346	SCOPE610D
16120	5433	SCOPE702
16711	5461	SCOPE713
17481	4370	SCOPE731
10533	7061	SECOND375A
16964	4470	SETADR722A
14830	5320	SETBUSA610A2
15062	5351	SETBUSA610C2
10680	7060	SETBYTEC410
12320	6260	SETCIN507F
8230	4233	SETD320E
8932	6010	SETDOC362A
9285	6044	SETDOC366C
10982	6126	SETFETCH0500
11867	6216	SETFLAG50SA
9751	7034	SETIR373A
13137	6317	SETIRS12C1
16175	4312	SETJAM710A
16062	5442	SETKT702A
8164	4225	SETONE320C
17912	4413	SETPRI762A
13094	6314	SETPSFLAGS12B1
8834	6570	SETRES361A
9324	6050	SETRES367A
14377	7370	SETRES8537A

LINE	LOCN	SYMBOL
18082	4423	READVECI763A
8469	7027	RESETIR350C
8769	4715	RESTORE01
9745	6552	RETURN373A
3533	5033	SCOPE015
3812	5050	SCOPE021
4001	5061	SCOPE025
4268	5075	SCOPE031
4465	5106	SCOPE035
4643	5120	SCOPE041
4900	5136	SCOPE045
5100	5150	SCOPE101
5758	5321	SCOPE105
6348	4042	SCOPE116C
6976	4114	SCOPE121C
7489	4154	SCOPE131B
7919	4211	SCOPE135B
8455	4356	SCOPE351
9888	6102	SCOPE373
10194	6321	SCOPE374D
10937	6125	SCOPE410
11995	6254	SCOPE505
12800	6301	SCOPE511A
13275	6333	SCOPE512E
13752	6372	SCOPE534D
14141	6440	SCOPE536D
14652	5323	SCOPE610A
15702	5413	SCOPE623
16310	5445	SCOPE710
16934	5454	SCOPE721
17675	4402	SCOPE740
18605	7250	SERVICETOO
15361	5373	SETADR621A
14693	5326	SETBUSA610B1
15119	5356	SETBUSA610D1
10685	7063	SETBYTED410
7210	4132	SETID2344
15760	6306	SETIDC34A
9040	6020	SETIDOC363A
9436	6062	SETIDOC370C
10987	6127	SETIFETCHE500
12457	6271	SETIFLAGS100
10602	5302	SETIR376A
13192	6626	SETIRS12D1
16753	7175	SETJAM720A
16101	6461	SETKT702B
8224	4232	SETONE320E
17966	7206	SETPRI762C
13143	6320	SETPSFLAGS12C1
8924	6007	SETRES362A
9367	6054	SETRES370A
15376	5375	SETRET621A

LINE	LOCN	SYMBOL
8530	4703	RESETIR350
18679	7263	RESETPROCDAT
8776	7030	RESTORE02
3185	5012	SCOPE012
3578	5035	SCOPE016
3836	5052	SCOPE022
4057	5067	SCOPE026
4333	5100	SCOPE032
4510	5110	SCOPE036
4747	5123	SCOPE042
4967	5136	SCOPE046
5260	5156	SCOPE102
5920	4007	SCOPE114A
6474	4052	SCOPE116D
7129	4126	SCOPE1210
7587	4163	SCOPE132B
8025	4220	SCOPE136B
8756	4475	SCOPE352
9973	6233	SCOPE374A
10267	6270	SCOPE374E
11192	6146	SCOPE500F
12121	6240	SCOPE506
12656	6305	SCOPE511B
13469	6346	SCOPE520
13866	6406	SCOPE534G
14228	6450	SCOPE536E
14970	5340	SCOPE610B
15684	5421	SCOPE624
16443	5446	SCOPE711
17045	4327	SCOPE722
17801	4410	SCOPE761
16748	7174	SETADR720A
15738	5424	SETDOC34A
14948	5365	SETBUSA610B2
15158	5363	SETBUSA610D2
10691	6000	SETBYTEE410
8111	4221	SETD320A
9622	6076	SETDC372A
9099	6025	SETDOC364A
14246	6451	SETEMITS37A
10992	6130	SETFETCHF500
15382	5377	SETFLG621A
13033	6564	SETIRS12A1
13241	6327	SETIRS12E1
16858	7200	SETJAM721A
16057	5441	SETLED702A
12370	6606	SETONES10A
12301	6256	SETPSU7F
13198	6324	SETPSFLAGS12D1
9153	6031	SETRES365A
9497	6067	SETRES371A
15754	5426	SETRET624A

LINE	LOCN	SYMBOL
10519	5506	SETSP375A
14506	4665	SETSR518
11965	6225	SETUCONS06A
13367	6336	SETUPS08
5862	7015	SETUPCSP00A
5842	7011	SETUPCSP14A
15197	7156	SETUPPSCC#0C
10428	7047	SFDFTOSRA
10446	7052	SFDFTOSRD
10470	7056	SFDFTOSRH
9290	6045	SHIFT366C
18747	7266	SRINTOIR
9639	6077	SUBRA372A
13492	7133	SUCCRTEST03
2682	5536	TEST004
2802	4775	TEST010
3088	5771	TEST012C
3169	5763	TEST012G
3272	5753	TEST013D
3368	5745	TEST014A
3473	5743	TEST015A
3598	5737	TEST017A
3711	5727	TEST020C
3833	5721	TEST022A
3986	5707	TEST025A
4147	5712	TEST030B
4253	5675	TEST031B
4398	5665	TEST034A
4574	5655	TEST040A
4703	5645	TEST042A
4833	5635	TEST044A
4988	5561	TEST047A
5108	5726	TEST050B
5303	5564	TEST102C
5449	5576	TEST103C
5582	5541	TEST105A
5690	5642	TEST105C
5906	4603	TEST114A2
5967	4604	TEST115A4
6044	4602	TEST115B4
6164	4626	TEST115D1
6257	4621	TEST116A2
6326	4606	TEST116B2
6413	4631	TEST116C4
6517	4644	TEST117A2
6592	4640	TEST117B2
6685	4667	TEST120A1
6767	4652	TEST120B2
6854	4676	TEST121A2
6928	4662	TEST121B2
7009	4605	TEST121C2
7083	4726	TEST121D2

LINE	LOCN	SYMBOL
9757	7037	SETSR373A
14546	4561	SETSR51C
13001	6655	SETUPS12A
13336	6740	SETUPS20C
5862	7013	SETUPCSP05A
5837	7010	SETUPCSP15A
15202	7161	SETUPPSCC#0C02
10423	7040	SFDFTOSRAA
10452	7053	SFDFTOSRE
10476	7057	SFDFTOSRI
9381	6056	SHIFT370A
18777	7272	SRINTOIR5
9689	5723	SUBRA372B
2633	4000	TEST001
2711	5146	TEST005
2847	5777	TEST011
3108	5767	TEST012D
3205	5761	TEST013A
3291	5751	TEST013H
3394	5752	TEST014B
3500	5772	TEST015B
3628	5736	TEST017B
3746	5725	TEST021A
3877	5717	TEST023A
4029	5705	TEST026A
4166	5713	TEST030C
4288	5673	TEST032A
4442	5663	TEST035A
4602	5653	TEST040B
4731	5643	TEST042B
4878	5633	TEST045A
5019	5670	TEST047B
5161	5553	TEST101A
5330	5554	TEST102D
5476	5674	TEST103D
5619	5610	TEST105A1
5716	5636	TEST105D
5939	4601	TEST115A1
6021	4614	TEST115B1
6104	4611	TEST115C1
6186	4625	TEST115D2
6271	4620	TEST116A3
6359	4635	TEST116C1
6429	4630	TEST116C5
6534	4643	TEST117A3
6609	4657	TEST117B3
6707	4655	TEST120A2
6784	4651	TEST120B3
6871	4675	TEST121A3
6945	4661	TEST121B3
7025	4717	TEST121C3
7100	4737	TEST121D3

LINE	LOCN	SYMBOL
12310	6257	SETSR507F
15395	5401	SETSR521A
13007	6307	SETUPS12B
13124	6342	SETUPS20D
5857	7014	SETUPCSP07A
5832	7002	SETUPCSP16A
17245	4344	SHIFTR300
10434	7050	SFDFTOSRB
10458	7054	SFDFTOSRF
9045	6021	SHIFT363A
9442	6063	SHIFT370C
8343	4240	START350
13482	7122	SUCCRTEST01
2654	6252	TEST002
2730	4474	TEST006
3031	5775	TEST012A
3127	5765	TEST012E
3233	5757	TEST013B
3312	5750	TEST013F
3414	5762	TEST014C
3519	5722	TEST015C
3662	5733	TEST020A
3775	5723	TEST021B
3920	5715	TEST024A
4074	5703	TEST027A
4189	5734	TEST030D
4317	5671	TEST032B
4486	5661	TEST036A
4638	5651	TEST041A
4767	5641	TEST043A
4920	5631	TEST046A
5039	5730	TEST047C
5225	5521	TEST102A
5370	5531	TEST103A
5516	5547	TEST104A
5642	5652	TEST105B
5743	5620	TEST105E
5983	4616	TEST115A2
6060	4613	TEST115B2
6126	4617	TEST115C2
6203	4624	TEST115D3
6288	4637	TEST116A4
6381	4633	TEST116C2
6452	4645	TEST116D
6549	4642	TEST117A4
6633	4656	TEST117C1
6724	4654	TEST120A3
6799	4650	TEST120B4
6885	4674	TEST121A4
6960	4660	TEST121B4
7040	4716	TEST121C4
7115	4736	TEST121D4

LINE	LOCN	SYMBOL
14481	4306	SETSR551A
15771	6454	SETSR524A
13338	6334	SETUPS20A
13452	6344	SETUPS20E
5847	7012	SETUPCSP12A
5826	5543	SETUPCSP17A
10415	5746	SFDFTOSR
10440	7051	SFDFTOSRC
10464	7055	SFDFTOSRG
9230	6040	SHIFT366A
9511	6071	SHIFT371A
2816	7000	SUBRD10
13487	7132	SUCCRTEST02
2673	6631	TEST003
2749	4377	TEST007
3069	5773	TEST012B
3147	5764	TEST012F
3253	5755	TEST013C
3331	5747	TEST013G
3436	5710	TEST014D
3555	5741	TEST016A
3689	5731	TEST020B
3797	5774	TEST021C
3949	5711	TEST024B
4117	5701	TEST030A
4224	5677	TEST031A
4354	5667	TEST033A
4531	5657	TEST037A
4667	5647	TEST041B
4796	5637	TEST043B
4950	5770	TEST046B
5077	5551	TEST050A
5277	5574	TEST102B
5423	5572	TEST103B
5543	5646	TEST104B
5666	5600	TEST105B1
5874	4607	TEST114A
6008	4615	TEST115A3
6077	4612	TEST115B3
6143	4627	TEST115C3
6235	4623	TEST116A1
6305	4636	TEST116A5
6386	4632	TEST116C3
6485	4647	TEST117A1
6570	4641	TEST117B1
6655	4677	TEST117C2
6745	4653	TEST120B1
6832	4665	TEST121A1
6906	4663	TEST121B1
6987	4707	TEST121C1
7061	4727	TEST121D1
7148	4671	TEST122A1

LINE	LOCN	SYMBOL
7172	4570	TEST122A2
7314	4550	TEST130A2
7423	4544	TEST131A2
7527	4516	TEST132A2
7630	4500	TEST133A2
7742	4503	TEST134A2
7855	4506	TEST135A2
7961	4476	TEST136A2
8138	4552	TEST320B
8256	4556	TEST320F
8471	4742	TEST350C
8612	4723	TEST351C
8713	4724	TEST352C
8894	6767	TEST361E
9010	6755	TEST362E
9119	6745	TEST364B
9256	6735	TEST366B
9405	6723	TEST370B
9538	6713	TEST371B
9814	6572	TEST373B
10105	5524	TEST374C2
10512	5517	TEST375A
10666	5507	TEST410
10879	6727	TEST410D
11100	6726	TEST500C
11318	6630	TEST503B
11407	6700	TEST503E
11495	6742	TEST503I
11647	6730	TEST504B
11742	6672	TEST504F
11847	6623	TEST505A
12034	6754	TEST506B
12144	6613	TEST507A
12265	6674	TEST507E
12418	6616	TEST510C
12524	6610	TEST510F
12789	7112	TEST511A4
12845	7120	TEST511B4
13108	6546	TEST512B2
13212	6576	TEST512D2
13360	6764	TEST520B
13528	6625	TEST533A
13691	6665	TEST534C
13844	6752	TEST534G
14019	6640	TEST536B
14196	6642	TEST536F
14539	4566	TEST551C
14919	5612	TEST610B2
15145	5624	TEST610D2
15344	5617	TEST621A
15495	5605	TEST621E
15605	5601	TEST622A

LINE	LOCN	SYMBOL
7188	4734	TEST122A3
7334	4530	TEST130B1
7443	4546	TEST131B1
7547	4517	TEST132B1
7652	4501	TEST133B1
7764	4504	TEST134B1
7877	4507	TEST135B1
7983	4475	TEST136B1
8157	4562	TEST320C
8337	4701	TEST350
8499	4743	TEST350D
8634	4712	TEST351D
8735	4725	TEST352D
8917	6765	TEST362A
9033	6753	TEST363A
9146	6743	TEST365A
9278	6733	TEST366C
9429	6721	TEST370C
9606	6571	TEST372A
9898	6563	TEST374
10178	5500	TEST374D2
10563	5625	TEST375B
10790	6711	TEST410A
10911	6705	TEST410E
11136	6746	TEST500D
11338	6632	TEST503C
11433	6710	TEST503F
11513	6756	TEST503J
11667	6740	TEST504C
11762	6702	TEST504G
11891	6712	TEST505B
12054	6744	TEST506C
12201	6724	TEST507B
12286	6647	TEST507F
12438	6600	TEST510D
12755	6607	TEST511A
12812	6551	TEST511B1
13026	6542	TEST512A1
13130	6556	TEST512C1
13234	6577	TEST512E1
13388	6772	TEST520C
13569	6633	TEST533B
13725	6635	TEST534D
13879	6661	TEST535A
14067	6655	TEST536C
14413	4572	TEST537A
14744	5627	TEST610A1
14987	5535	TEST610C1
15262	5511	TEST620A
15440	5613	TEST621B
15521	5603	TEST621F
15634	5577	TEST622B

LINE	LOCN	SYMBOL
7202	4735	TEST122A4
7365	4532	TEST130B2
7474	4750	TEST131B2
7572	4472	TEST132B2
7679	4502	TEST133B2
7791	4505	TEST134B2
7904	4477	TEST135B2
8010	4473	TEST136B2
8197	4537	TEST320D
8417	4752	TEST350A
8569	4732	TEST351A
8670	4705	TEST352A
8827	6573	TEST361A
8962	6763	TEST362B
9069	6751	TEST363B
9187	6741	TEST365B
9317	6731	TEST367A
9467	6717	TEST370D
9658	6701	TEST372B
9959	5604	TEST374A2
10251	5502	TEST374E2
10595	5513	TEST376A
10814	6704	TEST410B
10968	6561	TEST500
11164	6736	TEST500E
11379	6670	TEST503D
11453	6720	TEST503G
11531	6646	TEST503K
11688	6750	TEST504D
11783	6706	TEST504H
11912	6722	TEST505C
12076	6734	TEST506D
12221	6611	TEST507C
12363	6603	TEST510A
12475	6617	TEST510DA
12767	7074	TEST511A2
12823	7106	TEST511B2
13053	6544	TEST512A2
13157	6566	TEST512C2
13261	6535	TEST512E2
13417	6762	TEST520D
13615	6667	TEST534A
13765	6663	TEST534E
13926	6637	TEST535B
14103	6641	TEST536D
14469	4575	TEST551A
14806	5622	TEST610A2
15038	5602	TEST610C2
15286	5623	TEST620B
15458	5611	TEST621C
15550	5766	TEST621G
15657	5575	TEST622C

LINE	LOCN	SYMBOL
7283	4673	TEST130A1
7392	4541	TEST131A1
7502	4521	TEST132A1
7600	4523	TEST133A1
7705	4511	TEST134A1
7818	4513	TEST135A1
7931	4515	TEST136A1
8098	4543	TEST320A
8217	4554	TEST320E
8444	4753	TEST350B
8591	4722	TEST351B
8692	4713	TEST352B
8873	6771	TEST361D
8989	6757	TEST362D
9091	6747	TEST364A
9209	6737	TEST366A
9360	6725	TEST370A
9490	6715	TEST371A
9738	6541	TEST373A
10032	5606	TEST374B2
10324	5504	TEST374F2
10619	5614	TEST376A1
10844	6707	TEST410C
11070	6673	TEST500A
11238	6677	TEST503A
11359	6601	TEST503DA
11474	6732	TEST503H
11578	6615	TEST504A
11716	6760	TEST504E
11804	6716	TEST504I
11952	6621	TEST506A
12099	6605	TEST506E
12243	6557	TEST507D
12396	6675	TEST510B
12497	6604	TEST510E
12778	7110	TEST511A3
12834	7116	TEST511B3
13081	6565	TEST512B1
13185	6537	TEST512D1
13322	6627	TEST520A
13445	6775	TEST520E
13650	6634	TEST534B
13805	6636	TEST534F
13973	6657	TEST536A
14154	6653	TEST536E
14498	4576	TEST551B
14869	5533	TEST610B1
15101	5545	TEST610D1
15309	5621	TEST620C
15476	5607	TEST621D
15572	5754	TEST621H
15680	5573	TEST623

F08

LINE	LOCN	SYMBOL
15724	5571	TEST624A
15925	5563	TEST701A
16040	5477	TEST702A
16236	6645	TEST710C
16374	6534	TEST711B
16512	5505	TEST712B
16640	5616	TEST713B
16788	6520	TEST720B
16918	4577	TEST721C
17084	4471	TEST730A
17233	4461	TEST730D
17401	4456	TEST731C
17591	4453	TEST740B
17765	4771	TEST761B
17924	4751	TEST762B
18031	4711	TEST762F
18148	4710	TEST763D
11008	6671	TESTD500
15400	5522	UBRK621A
18301	6774	VFY001
18333	7375	VFY005
8371	7016	WRITESF350
9941	5227	ZERO374A2
10087	5246	ZERO374C2
10233	5264	ZERO374E2
17734	4772	ZEROOSR761A
10386	7044	ZEROSF
10375	7042	ZEROSFDF
19256	7402	ZTARGET402
19264	7406	ZTARGET406
19272	7412	ZTARGET412
19280	7416	ZTARGET416
19288	7422	ZTARGET422
19296	7426	ZTARGET426
19304	7432	ZTARGET432
19312	7436	ZTARGET436
19320	7442	ZTARGET442
19328	7446	ZTARGET446
19336	7452	ZTARGET452
19344	7456	ZTARGET456
19352	7462	ZTARGET462
19360	7466	ZTARGET466
19368	7472	ZTARGET472
19376	7476	ZTARGET476
19384	7502	ZTARGET502
19392	7506	ZTARGET506
19400	7512	ZTARGET512
19408	7516	ZTARGET516
19416	7522	ZTARGET522
19424	7526	ZTARGET526
19432	7532	ZTARGET532
19440	7536	ZTARGET536

LINE	LOCN	SYMBOL
15817	5565	TEST624B
15962	5523	TEST701B
16089	6761	TEST702B
16265	6574	TEST710D
16404	6530	TEST711C
16530	6524	TEST712C
16664	6522	TEST713C
16813	4760	TEST720C
16951	5463	TEST722A
17149	4466	TEST730B
17286	4462	TEST730E
17428	4455	TEST731D
17619	4452	TEST740C
17786	4774	TEST761C
17946	4740	TEST762C
18062	4761	TEST763A
11292	6714	TESTA503A
11031	6777	TESTINHASP500
15776	6255	UBRK624A
18308	4412	VFY002
18340	7374	VFY006
17861	4315	ZAP0762A
9992	5556	ZERO37481
10138	5514	ZERO37401
10284	5516	ZERO374F1
12531	6276	ZEROFLAG510E
10365	7036	ZEROSF020F04
10381	7043	ZEROSFDFA
19258	7403	ZTARGET403
19266	7407	ZTARGET407
19274	7413	ZTARGET413
19282	7417	ZTARGET417
19290	7423	ZTARGET423
19298	7427	ZTARGET427
19306	7433	ZTARGET433
19314	7437	ZTARGET437
19322	7443	ZTARGET443
19330	7447	ZTARGET447
19338	7453	ZTARGET453
19346	7457	ZTARGET457
19354	7463	ZTARGET463
19362	7467	ZTARGET467
19370	7473	ZTARGET473
19378	7477	ZTARGET477
19386	7503	ZTARGET503
19394	7507	ZTARGET507
19402	7513	ZTARGET513
19410	7517	ZTARGET517
19418	7523	ZTARGET523
19426	7527	ZTARGET527
19434	7533	ZTARGET533
19442	7537	ZTARGET537

LINE	LOCN	SYMBOL
15939	5776	TEST624C
15981	6770	TEST701C
16157	5475	TEST710A
16294	6575	TEST710E
16427	6526	TEST711D
16555	6523	TEST712D
16689	6521	TEST713D
16840	4571	TEST721A
17004	4464	TEST722B
17188	4460	TEST730C
17321	4755	TEST731A
17467	4454	TEST731E
17653	4451	TEST7400
17829	4773	TEST762A
17980	4741	TEST7620
18108	4720	TEST763B
11621	6766	TESTA504A
11023	6133	TESTINHBSP500
13329	6624	UCON520A
18313	4255	VFY003
10755	7366	WORD410
17122	4334	ZAP0BUF730A
10014	5236	ZERO37482
10160	5255	ZERO37402
10306	5273	ZERO374F2
15824	5427	ZEROIR624B
10370	7041	ZEROSF040F02
19252	7400	ZTARGET400
19260	7404	ZTARGET404
19268	7410	ZTARGET410
19276	7414	ZTARGET414
19284	7420	ZTARGET420
19292	7424	ZTARGET424
19300	7430	ZTARGET430
19308	7434	ZTARGET434
19316	7440	ZTARGET440
19324	7444	ZTARGET444
19332	7450	ZTARGET450
19340	7454	ZTARGET454
19348	7460	ZTARGET460
19356	7464	ZTARGET464
19364	7470	ZTARGET470
19372	7474	ZTARGET474
19380	7500	ZTARGET500
19388	7504	ZTARGET504
19396	7510	ZTARGET510
19404	7514	ZTARGET514
19412	7520	ZTARGET520
19420	7524	ZTARGET524
19428	7530	ZTARGET530
19436	7534	ZTARGET534
19444	7540	ZTARGET540

LINE	LOCN	SYMBOL
15864	5756	TEST624D
16011	5512	TEST701D
16212	6644	TEST710B
16328	5473	TEST711A
16460	5471	TEST712A
16594	5467	TEST713A
16730	5465	TEST720A
16894	4573	TEST721B
17029	4465	TEST722C
17211	4450	TEST730C1
17363	4457	TEST731B
17556	4744	TEST740A
17726	4745	TEST761A
17899	4553	TEST762A1
18006	4730	TEST762E
18128	4721	TEST763C
10707	6773	TESTD410
18089	4424	TESTVECT763A
18103	4733	VECTLOAD763A
18321	4433	VFY004
8364	4002	WRITEDF350
9919	5536	ZERO374A1
10065	5566	ZERO374C1
10211	5526	ZERO374E1
12504	6274	ZEROOS10E
17739	4403	ZEROIT761A
10392	7045	ZEROSFA
19254	7401	ZTARGET401
19262	7405	ZTARGET405
19270	7411	ZTARGET411
19278	7415	ZTARGET415
19286	7421	ZTARGET421
19294	7425	ZTARGET425
19302	7431	ZTARGET431
19310	7435	ZTARGET435
19318	7441	ZTARGET441
19326	7445	ZTARGET445
19334	7451	ZTARGET451
19342	7455	ZTARGET455
19350	7461	ZTARGET461
19358	7465	ZTARGET465
19366	7471	ZTARGET471
19374	7475	ZTARGET475
19382	7501	ZTARGET501
19390	7505	ZTARGET505
19398	7511	ZTARGET511
19406	7515	ZTARGET515
19414	7521	ZTARGET521
19422	7525	ZTARGET525
19430	7531	ZTARGET531
19438	7535	ZTARGET535
19446	7541	ZTARGET541

LINE	LOCN	SYMBOL
19448	7542	ZTARGET542
19456	7546	ZTARGET546
19464	7552	ZTARGET552
19472	7556	ZTARGET556
19480	7562	ZTARGET562
19488	7566	ZTARGET566
19496	7572	ZTARGET572
19504	7576	ZTARGET576
19512	7602	ZTARGET602
19520	7606	ZTARGET606
19528	7612	ZTARGET612
19536	7616	ZTARGET616
19544	7622	ZTARGET622
19552	7626	ZTARGET626
19560	7632	ZTARGET632
19568	7636	ZTARGET636
19576	7642	ZTARGET642
19584	7646	ZTARGET646
19592	7652	ZTARGET652
19600	7656	ZTARGET656
19608	7662	ZTARGET662
19616	7666	ZTARGET666
19624	7672	ZTARGET672
19632	7676	ZTARGET676
19640	7702	ZTARGET702
19648	7706	ZTARGET706
19656	7712	ZTARGET712
19664	7716	ZTARGET716
19672	7722	ZTARGET722
19680	7726	ZTARGET726
19688	7732	ZTARGET732
19696	7736	ZTARGET736
19704	7742	ZTARGET742
19712	7746	ZTARGET746
19720	7752	ZTARGET752
19728	7756	ZTARGET756
19736	7762	ZTARGET762
19744	7766	ZTARGET766
19752	7772	ZTARGET772
19760	7776	ZTARGET776

LINE	LOCN	SYMBOL
19450	7543	ZTARGET543
19458	7547	ZTARGET547
19466	7553	ZTARGET553
19474	7557	ZTARGET557
19482	7563	ZTARGET563
19490	7567	ZTARGET567
19498	7573	ZTARGET573
19506	7577	ZTARGET577
19514	7603	ZTARGET603
19522	7607	ZTARGET607
19530	7613	ZTARGET613
19538	7617	ZTARGET617
19546	7623	ZTARGET623
19554	7627	ZTARGET627
19562	7633	ZTARGET633
19570	7637	ZTARGET637
19578	7643	ZTARGET643
19586	7647	ZTARGET647
19594	7653	ZTARGET653
19602	7657	ZTARGET657
19610	7663	ZTARGET663
19618	7667	ZTARGET667
19626	7673	ZTARGET673
19634	7677	ZTARGET677
19642	7703	ZTARGET703
19650	7707	ZTARGET707
19658	7713	ZTARGET713
19666	7717	ZTARGET717
19674	7723	ZTARGET723
19682	7727	ZTARGET727
19690	7733	ZTARGET733
19698	7737	ZTARGET737
19706	7743	ZTARGET743
19714	7747	ZTARGET747
19722	7753	ZTARGET753
19730	7757	ZTARGET757
19738	7763	ZTARGET763
19746	7767	ZTARGET767
19754	7773	ZTARGET773
19762	7777	ZTARGE!777

LINE	LOCN	SYMBOL
19452	7544	ZTARGET544
19460	7550	ZTARGET550
19468	7554	ZTARGET554
19476	7560	ZTARGET560
19484	7564	ZTARGET564
19492	7570	ZTARGET570
19500	7574	ZTARGET574
19508	7600	ZTARGET600
19516	7604	ZTARGET604
19524	7610	ZTARGET610
19532	7614	ZTARGET614
19540	7620	ZTARGET620
19548	7624	ZTARGET624
19556	7630	ZTARGET630
19564	7634	ZTARGET634
19572	7640	ZTARGET640
19580	7644	ZTARGET644
19588	7650	ZTARGET650
19596	7654	ZTARGET654
19604	7660	ZTARGET660
19612	7664	ZTARGET664
19620	7670	ZTARGET670
19628	7674	ZTARGET674
19636	7700	ZTARGET700
19644	7704	ZTARGET704
19652	7710	ZTARGET710
19660	7714	ZTARGET714
19668	7720	ZTARGET720
19676	7724	ZTARGET724
19684	7730	ZTARGET730
19692	7734	ZTARGET734
19700	7740	ZTARGET740
19708	7744	ZTARGET744
19716	7750	ZTARGET750
19724	7754	ZTARGET754
19732	7760	ZTARGET760
19740	7764	ZTARGET764
19748	7770	ZTARGET770
19756	7774	ZTARGET774

LINE	LOCN	SYMBOL
19454	7545	ZTARGET545
19462	7551	ZTARGET551
19470	7555	ZTARGET555
19478	7561	ZTARGET561
19486	7565	ZTARGET565
19494	7571	ZTARGET571
19502	7575	ZTARGET575
19510	7601	ZTARGET601
19518	7605	ZTARGET605
19526	7611	ZTARGET611
19534	7615	ZTARGET615
19542	7621	ZTARGET621
19550	7625	ZTARGET625
19558	7631	ZTARGET631
19566	7635	ZTARGET635
19574	7641	ZTARGET641
19582	7645	ZTARGET645
19590	7651	ZTARGET651
19598	7655	ZTARGET655
19606	7661	ZTARGET661
19614	7665	ZTARGET665
19622	7671	ZTARGET671
19630	7675	ZTARGET675
19638	7701	ZTARGET701
19646	7705	ZTARGET705
19654	7711	ZTARGET711
19662	7715	ZTARGET715
19670	7721	ZTARGET721
19678	7725	ZTARGET725
19686	7731	ZTARGET731
19694	7735	ZTARGET735
19702	7741	ZTARGET741
19710	7745	ZTARGET745
19718	7751	ZTARGET751
19726	7755	ZTARGET755
19734	7761	ZTARGET761
19742	7765	ZTARGET765
19750	7771	ZTARGET771
19758	7775	ZTARGET775

H08

LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
4000	TEST001	INITIALIZE12	WRITEDF350	ALU114A	GETZEROES114A	GOBUT114A	GOBUT114A2	SCOPE114A
4010	GETALTN115A1	GOBUT115A1	GOBUT115A4	GOBUT115A2	GOBUT115A3	ALU1158	GOBUT11581	GOBUT11584
4020	GOBUT11582	GOBUT11583	SCOPE115B	GOBUT115C1	GOBUT115C2	GOBUT115C3	ALU115D1	GOBUT115D1
4030	GOBUT115D2	GOBUT115D3	SCOPE115D	GOBUT116A1	GOBUT116A2	GOBUT116A3	GOBUT116A4	GOBUT116A5
4040	ALU116B	GOBUT116B	SCOPE116C	GOBUT116C1	GOBUT116C2	GOBUT116C3	GOBUT116C4	GOBUT116C5
4050	ALU116D	GOBUT116D	SCOPE116D	GOBUT117A1	GOBUT117A2	GOBUT117A3	GOBUT117A4	ALU117B1
4060	GOBUT11781	GOBUT11782	GOBUT11783	ALU117C1	GOBUT117C1	GOBUT117C2	SCOPE117C	GOBUT120A1
4070	GOBUT120A2	GOBUT120A3	ALU120B1	GOBUT120B1	GOBUT120B2	GOBUT120B3	GOBUT120B4	SCOPE120B
4100	LOADD10	INITIALIZE10	INITIALIZE11	GOBUT121A1	GOBUT121A2	GOBUT121A3	GOBUT121A4	ALU121B1
4110	GOBUT121B1	GOBUT121B2	GOBUT121B3	GOBUT121B4	SCOPE121C	GOBUT121C1	GOBUT121C2	GOBUT121C3
4120	GOBUT121C4	ALU121D1	GOBUT121D1	GOBUT121D2	GOBUT121D3	GOBUT121D4	SCOPE121D	GOBUT122A1
4130	GOBUT122A2	GOBUT122A3	SETD122A4	GOBUT122A4	SCOPE122A	COMP130A1	GOBUT130A1	GOBUT130A2
4140	ARITH130B1	COMP130B1	GOBUT130B1	GOBUT130B2	SCOPE130B	COMP131A1	GOBUT131A1	GOBUT131A2
4150	ARITH131B1	COMP131B1	GOBUT131B1	GOBUT131B2	SCOPE131B	GOBUT132A1	GOBUT132A2	ARITH132B1
4160	GOBUT132B1	GOBUT132B2	SCOPE132B	DOPA133A1	GOTEST133A1	GOBUT133A2	OPA133B1	GOTEST133B1
4170	GOBUT133B2	SCOPE133B	OPB134A1	DOPA134A1	GOTEST134A1	GOBUT134A2	OPA134B1	GOTEST134B1
4200	GOBUT134B2	SCOPE134B	OPB135A1	DOPA135A1	GOTEST135A1	GOBUT135A2	OPA135B1	GOTEST135B1
4210	GOBUT135B2	SCOPE135B	DOPA136A1	GOTEST136A1	GOBUT136A2	OPA136B1	GOTEST136B1	GOBUT136B2
4220	SCOPE136B	SETD320A	GETDC320A	GOBUT320A	GOBUT320B	SETONE320C	SETD320C	GETDC320C
4230	GOBUT320C	GOBUT320D	SETONE320E	SETD320E	GETDC320E	GOBUT320E	GOBUT320F	SCOPE320D
4240	START350	LOADSR0350	BL1-537A	GOBUT350A	COMP350B	GOBUT350B	COMP350C	GOBUT350C
4250	COMP350D	GOBUT350D	SCOPE350	NEXTPATA350	LOADD6-351	VFY003	GOBUT351A	COMP351B
4260	GOBUT351B	COMP351C	GOBUT351C	COMP351D	GOBUT351D	SCOPE351	GOBUT352A	COMP352B
4270	GOBUT352B	COMP352C	GOBUT352C	COMP352D	GOBUT352D	SCOPE352	LOAD14537A	LOADD3537A
4300	LOADD1537A	COUNTERD1	COMP537A	GOBUT537A	SCOPE537A	LOADIN551A	SETSR551A	LOADADR710A
4310	COUNTERD2	BUSFCN711A	SETJAM710A	BUSFCN710A	GENADR712A	ZAPD762A	BUSFCN712A	GOTEST720C
4320	LOADRET721A	GOTEST721B	GOTEST721C	SETJAM722A	BUSFCN722A	GOTEST722B	GOTEST722C	SCOPE722
4330	LOADDATA730A	BUSFCN730A	GETDBUF730A	COMP730A	ZAPDBUF730A	GOBUT730A	EXPEC730B	BUSFCN730B
4340	GETIT730B	GOBUT730B	GOBUT730C	LOADDATA730D	SETZER730D	MANGLED730D	BUSFCN730D	GETIT730D
4350	GOBUT730D	GOBUT730E	SCOPE730	GETDBUF731A	COMP731A	GOBUT731A	BUSFCN731B	GETIT731B
4360	GOBUT731B	COMP731C	GOBUT731C	LOADIR731D	BUSFCN731D	MANGLED731D	GOBUT731D	GOBUT731E
4370	SCOPE731	BUSFCN740A	LOADIR740B	BUSFCN740B	BUSFCN740C	GOBUT740C	BUTERROR4	TEST007
4400	LOADIR740D	BUSFCN740D	SCOPE740	ZEROIT761A	CLEAR761A	GOBUT761A	GOBUT761B	GOBUT761C
4410	SCOPE761	DWI1L762A	VFY002	SETPRI762A	FILL762C	DELAY762C	GOBUT762D	EXPEC762E
4420	GOGET762E	GOBUT762F	EXPEC763A	READVECT763A	TESTVECT763A	GOBUT763B	GOBUT763C	GOBUT763D
4430	SCOPE763	EOP001	. . . .	VFY004	JAMUPP002C	JAMUPP006	JAMUPP007	JAMUPP010
4440	JAMUPP011	. . . .	. . . .	GOBUT730C1	. . .	NEXT710A	NEXT711A	NEXT712A
4450	TEST730C1	TEST740D	TEST740C	TEST740B	TEST731E	TEST731D	TEST731C	TEST731B
4460	TEST730C	TEST730D	TEST730E	SETPR6-762A	TEST722B	TEST722C	TEST730B	NEXTD762A
4470	SETADR722A	TEST730A	TEST13282	TEST13682	TEST006	TEST13681	TEST136A2	TEST13582
4500	TEST133A2	TEST133B1	TEST13382	TEST134A2	TEST134B1	TEST13482	TEST135A2	TEST13581
4510	OPB133A1	TEST134A1	OPA134A1	TEST135A1	OPA135A1	TEST136A1	TEST132A2	TEST13281
4520	ARITH131A1	TEST132A1	ARITH132A1	TEST133A1	NEXT722A	COUNTER09	COUNTER03	COUNTER10
4530	TEST130B1	COUNTER10B	TEST13082	COUNTER10A	COUNTER06	COUNTER07	COUNTER08	TEST320D
4540	ARITH130A1	TEST131A1	OPB136A1	TEST320A	TEST131A2	COUNTER04	TEST13181	COUNTER11
4550	TEST130A2	BUMPD762A	TEST320B	TEST762A1	TEST320E	COUNTER12	TEST320F	COUNTER05
4560	GOTEST551B	SETSR551C	TEST320C	DINTOIRA350	GOTEST551A	SETSR551B	TEST551C	LOADD5-351
4570	TEST122A2	TEST721A	TEST537A	TEST721B	LOAD16537A	TEST551A	TEST551B	TEST721C
4600	GETONES114A	TEST115A1	TEST11584	TEST114A2	TEST115A4	TEST121C2	TEST1168	TEST114A
4610	ALU115A1	TEST115C1	TEST11583	TEST115B2	TEST115B1	TEST115A3	TEST115A2	TEST115C2
4620	TEST116A3	TEST116A2	ALU115C1	TEST116A1	TEST115D3	TEST115D2	TEST115D1	TEST115C3
4630	TEST116C5	TEST116C4	TEST116C3	TEST116C2	ALU116A1	TEST116C1	TEST116A5	TEST116A4

I08

LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
4640	TEST117B2	TEST117B1	TEST117A4	TEST117A3	TEST117A2	TEST116D	ALU116C1	TEST117A1
4650	TEST120B4	TEST120B3	TEST120B2	TEST120B1	TEST120A3	TEST120A2	TEST117C1	TEST117B3
4660	TEST121B4	TEST121B3	TEST121B2	TEST121B1	ALU120A1	TEST121A1	ALU117A1	TEST120A1
4670	ALU121C1	TEST122A1	ALU122A1	TEST130A1	TEST121A4	TEST121A3	TEST121A2	TEST117C2
4700	SETONE320A	TEST350	COMP350A	RESETIR350	COMP351A	TEST352A	ALU121A1	TEST121C1
4710	TEST763D	TEST762F	TEST351D	TEST352B	COMP352A	RESTORE01	TEST121C4	TEST121C3
4720	TEST763B	TEST763C	TEST351B	TEST351C	TEST352C	TEST352D	TEST121D2	TEST121D1
4730	TEST762E	ALLOW763A	TEST351A	VECTLOAD763A	TEST122A3	TEST122A4	TEST121D4	TEST121D3
4740	TEST762C	TEST762D	TEST350C	TEST350D	TEST740A	TEST761A	JAMUPP004	JAMUPP005
4750	TEST131B2	TEST762B	TEST350A	TEST350B	LOADIR730A	TEST731A	JAMUPP003	JAMUPP002B
4760	TEST720C	TEST763A	GOBUT762B	KILL764A	BUSFCN731A	LOADIR740A	GOBUT740B	GOBUT740D
4770	. . . .	TEST761B	ZERODSR761A	TEST762A	TEST761C	TEST010	GOBUT740A	JAMUPP001

LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
5000	SETDC372B	LOADD11	LOADD12A	GOBUTD12A	GOBUTD12B	GOBUTD12C	GOBUTD12D	GOBUTD12E
5010	GOBUTD12F	GOBUTD12G	SCOPED12	GOBUTD13A	GOBUTD13B	GOBUTD13C	GOBUTD13D	GOBUTD13E
5020	GOBUTD13F	GOBUTD13G	SCOPED13	GOBUTD14A	GOBUTD14B	GOBUTD14C	GOBUTD14D	SCOPED14
5030	GOBUTD15A	GOBUTD15B	GOBUTD15C	SCOPED15	GOBUTD16A	SCOPED16	GOBUTD17A	GOBUTD17B
5040	SCOPED17	GOBUTD20A	GOBUTD20B	GOBUTD20C	SCOPED20	GOBUTD21A	GOBUTD21B	GOBUTD21C
5050	SCOPED21	GOBUTD22A	SCOPED22	GOBUTD23A	SCOPED23	GOBUTD24A	GOBUTD24B	SCOPED24
5060	GOBUTD25A	SCOPED25	GOBUTD26A	SCOPED26	GOBUTD27A	SCOPED27	GOBUTD30A	GOBUTD30B
5070	GOBUTD30C	GOBUTD30D	SCOPED30	GOBUTD31A	GOBUTD31B	SCOPED31	GOBUTD32A	GOBUTD32B
5100	SCOPED32	GOBUTD33A	SCOPED33	GOBUTD34A	SCOPED34	GOBUTD35A	SCOPED35	GOBUTD36A
5110	SCOPED36	GOBUTD37A	SCOPED37	GOBUTD40A	GOBUTD40B	SCOPED40	GOBUTD41A	GOBUTD41B
5120	SCOPED41	GOBUTD42A	GOBUTD42B	SCOPED42	GOBUTD43A	GOBUTD43B	SCOPED43	GOBUTD44A
5130	SCOPED44	GOBUTD45A	SCOPED45	GOBUTD46A	GOBUTD46B	SCOPED46	GOBUTD47A	GOBUTD47B
5140	GOBUTD47C	SCOPED47	GOBUTD50A	LOADD50B	GOBUTD50B	SCOPED50	TESTD05	GOTESTI01A
5150	SCOPEI01	LOADD2-102A	LOADD4-102A	LOADI0-102A	LOADD0-102A	LOADD102A	GOTESTI02A	LOADD102B
5160	GOTESTI02B	LOADD102C	GOTESTI02C	LOADD102D	GOTESTI02D	SCOPEI02	LOADI5-103A	LOADI3-103A
5170	LOADD7-103A	LOADI7-103A	LOADDI03A	GOTESTI03A	LOADDI03B	GOTESTI03B	LOADDI03C	GOTESTI03C
5200	LOADDI03D	GOTESTI03D	SCOPEI03	GOTESTI04A	LOADDI04B	GOTESTI04B	SCOPEI04	GOTESTI05A
5210	GOBUTI05A1	LOADSRI05B	GOTESTI05B	GOBUTI05B1	LOADSRI05C	GOTESTI05C	LOADSRI05D	GOTESTI05D
5220	GOTESTI05E	SCOPEI05	EXPEC374A1	SUBRA372B	SCOPE624	DOWRITE374A1	GETTEM374A1	ZERO374A2
5230	DOWRITE374A2	GETTEM374A2	GOTEST374A2	SCOPE374A	DOWRITE374B1	GETTEM37481	ZERO374B2	DOWRITE374B2
5240	GETTEM374B2	GOTEST374B2	SCOPE374B	DOWRITE374C1	GETTEM374C1	NEXTD10	ZERO374C2	DOWRITE374C2
5250	GETTEM374C2	GOTEST374C2	SCOPE374C	DOWRITE374D1	GETTEM374D1	ZERO374D2	DOWRITE374D2	GETTEM374D2
5260	GOTEST374D2	SCOPE374D	DOWRITE374E1	GETTEM374E1	ZERO374E2	DOWRITE374E2	GETTEM374E2	GOTEST374E2
5270	SCOPE374E	DOWRITE374F1	GETTEM374F1	ZERO374F2	DOWRITE374F2	GETTEM374F2	GOTEST374F2	SCOPE374F
5300	CHECK375B	GOBUT375B	SETIR376A	GOBUT376A	SCOPE376	SCOPE551	LOADDI-610A1	LOADD5-610A1
5310	LOADD6-610A1	PSCC-DC610A1	SETBUSA610A1	DOIT610A1	GETIT610A1	LOADD6-610A2	LOADDI-610A2	PSCC-DC610A2
5320	SETBUSA610A2	DOIT610A2	GETIT610A2	SCOPE610A	LOADDI-610B1	PSCC-DC610B1	SETBUSA610B1	DOIT610B1
5330	GETIT610B1	LOADIA610B2	LOADD7-610B2	LOADDI-610B2	PSCC-DC610B2	SETBUSA610B2	DOIT610B2	GETIT610B2
5340	SCOPE610B	LOADDI-610C1	PSCC-DC610C1	SETBUSA610C1	DOIT610C1	GETIT610C1	LOADD5-610C2	LOADDI-610C2
5350	PSCC-DC610C2	SETBUSA610C2	DOIT610C2	GETIT610C2	SCOPE610C	PSCC-DC610D1	SETBUSA610D1	DOIT610D1
5360	GETIT610D1	PSCC-DC610D2	SETBUSA610D2	DOIT610D2	GETIT610D2	SCOPE610D	GOBUT620A	GOBUT620B
5370	MASK620C	GETJAM620C	CSPIL621A	SETBRK621A	LODBRK621A	SETRET621A	BUTERRORS	SETFLG621A
5400	LODFLG621A	SETSR621A	GOBUT621B	GOBUT621C	GOBUT621D	EXPEC621E	GETJAM621E	EXPEC621F
5410	GETCUA621F	GOBUT621G	COMP621H	BCIFCM622A	CNST0622A	GOBUT622A	BCERC622B	GOBUT622B
5420	GETJAM622C	EXPEC623	GETCUA623	SCOPE623	SETBRK624A	LODBRK624A	SETRET624A	ZEROIR624B
5430	EXPEC624C	GETCUA624C	GOBUT624D	SCOPE702	GOBUT701B	GOBUT701D	SCOPE701	EXPEC702A
5440	DOIT376A	SETLED702A	SETKT702A	LOADBA702A	GOTESI702A	SCOPE710	SCOPE711	SCOPE712
5450	GOTEST712B	SCOPE713	EXPEC713B	GOTEST713B	SCOPE721		LOADRET722A	
5460			LOADRET720A	TEST722A	LOADRET713A	TEST720A	LOADRET712A	TEST713A
5470	LOADRET711A	TEST712A	LOADRET710A	TEST711A	MASK702A	TEST710A	MASK701A	TEST702A
5500	TEST374D2	SCOPE372B	TEST374E2	LOAD372B	TEST374F2	TEST712B	SETSP375A	TEST410
5510	LOADDI-610D1	TEST620A	TEST701D	TEST376A	ZERO374D1	EXPEC374E1	ZERO374F1	TEST375A
5520	LOADD101A	TEST102A	UBRK621A	TEST701B	TEST374C2	TEST004	ZERO374E1	EXPEC374F1
5530	LOADDI-102A	TEST103A	LOADIR610A1	TEST610B1	LOADIR610B1	TEST610C1	ZERO374A1	EXPEC374B1
5540	LOADD104A	TEST105A	LOADSR105A	SETUPCSP17A	LOADIR610C1	TEST610D1	LOADI6-103A	TEST104A
5550	LOADD47A	TEST050A	LOADD50A	TEST101A	TEST1020	CUA372B	ZERO374B1	EXPEC374C1
5560	LOADD46A	TEST047A	LODIR624A	TEST701A	TEST102C	TEST624B	ZERO374C1	EXPEC374D1
5570	BCERC620A	TEST624A	TEST1038	TEST623	TEST1028	TEST622C	TEST103C	TEST622B
5600	TEST10581	TEST622A	TEST610C2	TEST621F	TEST374A2	TEST621E	TEST37482	TEST621D
5610	TEST105A1	TEST621C	TEST61082	TEST621B	TEST376A1	ERROR621A	TEST713B	TEST621A
5620	TEST105E	TEST620C	TEST610A2	TEST620B	TEST610D2	TEST375B	GOTEST551C	TEST610A1
5630	LOADD45A	TEST046A	LOADD44A	TEST045A	LOADD43A	TEST044A	TEST105D	TEST043B

K08

LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
5640	LOAD042A	TEST043A	TEST105C	TEST042B	LOAD041A	TEST042A	TEST104B	TEST041B
5650	LOAD040A	TEST041A	TEST105B	TEST040B	LOAD037A	TEST040A	LOAD036A	TEST037A
5660	LOAD035A	TEST036A	LOAD034A	TEST035A	LOAD033A	TEST034A	LOAD032A	TEST033A
5670	TEST047B	TEST032B	LOAD031A	TEST032A	TEST103D	TEST031B	LOAD030A	TEST031A
5700	LOAD027A	TEST030A	LOAD026A	TEST027A	LOAD025A	TEST026A	LOAD024A	TEST025A
5710	TEST014D	TEST024B	TEST030B	TEST030C	LOAD023A	TEST024A	LOAD022A	TEST023A
5720	LOAD021A	TEST022A	TEST015C	TEST021B	LOAD020A	TEST021A	TEST050B	TEST020C
5730	TEST047C	TEST020B	LOAD017A	TEST020A	TEST030D	TEST017B	LOAD016A	TEST017A
5740	LOAD015A	TEST016A	LOAD014A	TEST015A	LOAD013A	TEST014A	SFDFTOSR	TEST013G
5750	TEST013F	TEST013E	TEST014B	TEST013D	TEST621H	TEST013C	TEST624D	TEST013B
5760	SETIRA	TEST013A	TEST014C	TEST012G	TEST012F	TEST012E	TEST621G	TEST012D
5770	TEST046B	TEST012C	TEST015B	TEST012B	TEST021C	TEST012A	TEST624C	TEST011

L08

LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
6000	SETBYTEE410	LOADRES361A	LOADSR361A	EXPEC361B	COMP361B	GOBUT361D	GOBUT361E	SETRES362A
6010	SETDOC362A	LOADRES362A	COMP362A	GOBUT362A	EXPEC362B	COMP362B	GOBUT362D	GOBUT362E
6020	SETDOC363A	SHIFT363A	COMP363A	GOBUT363A	GOBUT363B	SETDOC364A	GOBUT364A	SETDOC364B
6030	GOBUT364B	SETRES365A	LOADRES365A	EXPEC365A	COMP365A	GOBUT365B	SETRES366A	LOADRES366A
6040	SHIFT366A	EXPEC366A	COMP366A	GOBUT366B	SETDOC366C	SHIFT366C	EXPEC366C	COMP366C
6050	SETRES367A	LOADRES367A	LOADSR367A	GOBUT367B	SETRES370A	LOADRES370A	SHIFT370A	COMP370A
6060	GOBUT370A	GOBUT370B	SETDOC370C	SHIFT370C	COMP370C	GOBUT370C	GOBUT370D	SETRES371A
6070	LOADRES371A	SHIFT371A	COMP371A	GOBUT371A	GOBUT371B	SCOPE371	SETDC372A	SUBR372A
6100	PAGE372B	GOBUT373B	SCOPE373	LOADRES374	LOADDCS506A	SETBYTEC410	COMP410A	INTOIR410A
6110	EXPEC410B	COMP410B	GOPUT410B	EXPEC410C	ASIDE410C	COMP410C	GOBUT410C	EXPEC410D
6120	COMP410D	GOBUT410D	EXPEC410E	COMP410E	GOBUT410E	SCOPE410	SETFETCHD500	SETFETCHE500
6130	SETFETCHF500	SETFETCHG500	LOADIR500	TESTINTRSP500	COMP500A	GOBUT500A	EXPEC500C	COMP500C
6140	GOBUT500C	COMP500D	GOBUT500D	EXPEC500E	COMP500E	GOBUT500E	SCOPE500F	LOADFPS503A
6150	EXPEC503A	MASKS03A	LOADFCCS03A	DOFCCS03A	GOPUT503A	GOBUT503A	GOBUT503B	GOBUT503C
6160	GOBUT503DA	LOADIR503D	GOBUT503D	EXPEC503E	GOPUT503E	GOBUT503F	GOBUT503G	GOBUT503H
6170	GOBUT503I	GOBUT503J	GOBUT503K	SCOPE503	LOADFPS504A	EXPEC504A	LOADFCC504A	DOFCC504A
6200	GOPUT504A	GOBUT504A	GOBUT504B	GOBUT504C	LOADIR504D	GOBUT504D	EXPEC504E	GOPUT504E
6210	GOBUT504F	GOBUT504G	GOBUT504H	GOBUT504I	SCOPE504	EXPEC505A	SETFLAG505A	BUTCLR505A
6220	GOPUT505A	GOBUT505B	CUA372A	GOBUT505C	SCOPE505	SETUCON506A	PSHI506A	PSMID506A
6230	PSLO506A	FUDGEPS506A	MFSS01	GOBUT506B	GOBUT506C	GOBUT506D	CLEARS06E	GOBUT506E
6240	SCOPE506	PSHI507A	PSMID507A	PSLO507A	FUDGEPS507A	LOADDCS507A	GOBUT507A	GOBUT507B
6250	GOBUT507C	GOBUT507D	TEST002	GOBUT507E	CINS07F	UBRK624A	SETPS507F	SETSR507F
6260	SETCINS07F	GOBUT507F	SCOPE507	LOADPRIO510A	GOBUT510A	GOBUT510B	GOBUT510C	FLAG510D
6270	ENFLAG510D	SETFLAG510D	GOBUT510D	GOBUT510DA	ZEROO510E	GOBUT510E	ZEROFLAG510E	GOBUT510F
6300	SCOPE510	SCOPE511A	MFSS02	MFSS03	MFSS04	SCOPE511B	SETD624A	SETUPS12B
6310	SETPSFLAGS12A1	GOTESTS12A1	GOTESTS12A2	SCOPES12A	SETPSFLAGS12B1	GOTESTS12B1	GOTESTS12B2	SETIRS12C1
6320	SETPSELAGS12C1	GOTESTS12C1	GOTESTS12C2	SCOPES12C	SETPSELAGS12D1	GOTESTS12D1	GOTESTS12D2	SETIRS12E1
6330	SETPSFLAGS12E1	GOTESTS12E1	GOTESTS12E2	SCOPES12E	SETUPS20A	GOTESTS20A	SETUPS20B	GOTESTS20B
6340	SETUPS20C	GOTESTS20C	SETUPS20D	GOTESTS20D	SETUPS20E	GOTESTS20E	SCOPES20	INITDS33A
6350	COMPS33A	GOBUTS33A	INITS33B	INITDS33B	COMPS33B	GOBUTS33B	SCOPES33B	COMPS34A
6360	GOBUTS34A	INITDS34B	COMPS34B	GOBUTS34B	SCOPES34B	COMPS34C	GOBUTS34C	INITDS34D
6370	COMPS34D	GOBUTS34D	SCOPES34D	INITDS34E	COMPS34E	GOBUTS34E	BUTERROR6	NEXTPATS00
6400	LODCNTRS34F	INITDS34F	COMPS34F	GOBUTS34F	COUNTERS34G	GOBUTS34G	SCOPES34G	EXPECS35A
6410	INITDS35A	COMPS35A	GOBUTS35A	EXPECS35B	INITDS35B	COMPS35B	GOBUTS35B	SCOPES35B
6420	EXPECS36A	INITDS36A	COMPS36A	GOBUTS36A	EXPECS36B	INITDS36B	COMPS36B	GOBUTS36B
6430	SCOPES36B	COMPS36C	GOBUTS36C	INITS36D	EXPECS36D	INITDS36D	COMPS36D	GOBUTS36D
6440	SCOPES36D	INITDS36E	COMPS36E	GOBUTS36E	LOADSRS36F	INITDS36F	COMPS36F	GOBUTS36F
6450	SCOPES36F	AR3-537A	EOP002	SETFLG624A	SETSR624A	EXPEC701C	LOADBA701C	GOTEST701C
6460	EXPEC702B	SETKT702B	LOADBA702B	GOTEST702B	GOTEST710B	EXPEC710C	GOTEST710C	EXPEC710D
6470	CLEAR710D	GOTEST710D	GOTEST710E	EXPEC711B	GOTEST711B	EXPEC711C	GOTEST711C	GOTEST711D
6500	GOBUT712C	EXPEC712D	GOTEST712D	GOBUT713C	EXPEC713D	GOTEST713D	GOTEST720B	. . . .
6510	EOP003	EOP004	EOP007	.	.	.	.	.
6520	TEST720B	TEST713D	TEST713C	TEST712D	TEST712C	ASSERTFOV500	TEST711D	FIXPAT500
6530	TEST711C	DNONZERO410	INITIALIZE01	DZERO410	TEST711B	TEST512E2	SETIRS1281	TEST512D1
6540	LOOP372A	TEST373A	TEST512A1	ERRORD10	TEST512A2	MFSSEXPEC0	TEST51282	MFSSEXPEC1
6550	GOTEST511A1	TEST511B1	MFSS05	MFSS06	GOTEST511B1	SETUPS12A	TEST512C1	TEST507D
6560	SETBYTEB410	TEST500	RETURN373A	TEST374	SETIRS12A1	TEST51281	TEST512C2	ERROR624A
6570	SETRES361A	TEST372A	TEST373B	TEST361A	TEST710D	TEST710E	TEST51202	TEST512E1
6600	TEST510D	TEST503DA	EXPEC507A	TEST510A	TEST510E	TEST506E	SETONES10A	TEST511A
6610	TEST510F	TEST507C	EXPEC506A	TEST507A	LOADFLAG503A	TEST504A	TEST510C	TEST510DA
6620	LOADS05A	TEST506A	LOADFLAG504A	TEST505A	UCONS20A	TEST533A	SETIRS12D1	TEST520A
6630	TEST503B	TEST003	TEST503C	TEST533B	TEST534B	TEST534D	TEST534F	TEST535B

MICRO XREF V007-A 14-MAR-77 01:30:34

LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
6640	TEST536B	TEST536D	TEST536F	NEWCIRS37A	IEST710B	IEST710C	TEST503K	IEST507F
6650	LOADSRS36E	SETEMIT537A	INITD536C	TEST536E	INIT536A	TEST536C	INIT535A	TEST536A
6660	LODCNTRS34E	TEST535A	INITD534C	TEST534E	INITD534A	TEST534C	INIT533A	TEST534A
6670	TEST503D	TESTD500	TEST504F	TEST500A	TEST507E	TEST5108	SETFETCH8500	TEST503A
6700	TEST503E	TEST372B	TEST504G	LOAD372A	TEST410B	TEST410E	TEST504H	TEST410C
6710	TEST503F	TEST410A	TEST5058	TEST371B	TESTA503A	TEST371A	TEST504I	TEST370D
6720	TEST503G	TEST370C	TEST505C	TEST370B	TEST507B	TEST370A	TEST500C	TEST410D
6730	TEST504B	TEST367A	TEST503H	TEST366C	TEST506D	TEST366B	TEST500E	TEST366A
6740	TEST504C	TEST365B	TEST503I	TEST365A	TEST506C	TEST364B	TEST500D	TEST364A
6750	TEST504D	TEST363B	TEST534G	TEST363A	TEST506B	TEST362E	TEST503J	TEST362D
6760	TEST504E	TEST702B	TEST520D	TEST362B	TEST520B	TEST362A	TESTA504A	TEST361E
6770	TEST701C	TEST361D	TEST520C	TESTD410	VFY001	TEST520E	EOP006	TESTINHASP500

N08

LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
7000	SUBRO10	INITIALIZE03	SETUPCSP16A	INITIALIZE04	INITIALIZE05	INITIALIZE06	INITIALIZE07	ALUCARRY1
7010	SETUPCSP15A	SETUPCSP14A	SETUPCSP12A	SETUPCSP05A	SETUPCSP07A	SETUPCSP00A	WRITESF350	ALUCARRY1A
7020	ALUCARRY2	ALUCARRY2A	RESETIR350A	NEXTPAT350	LOADHIA350	AGAINSRD350	RESETIR350B	RESETIR350C
7030	RESTORE02	CSP16XORSRTOIRS	RESTORE03	RESTORE04	SETIR373A	CSP16XORFLTTOIR	ZEROSF020F04	SETSR373A
7040	SFDFTOSR9A	ZEROSF040F02	ZEROSFDF	ZEROSFDFA	ZEROSF	ZEROSFA	FIRST375A	SFDFTOSR9
7050	SFDFTOSR8	SFDFTOSRC	SFDFTOSR0	SFDFTOSRE	SFDFTOSRF	SFDFTOSRG	SFDFTOSRH	SFDFTOSRI
7060	SETBYTEC410	SECOND375A	BYTE375A	CHECK375A	GOBUT375A	NEXTPAT410	SETBYTED410	LOADUCONS06A
7070	BYTEFIRST410	GOBUTS06A	DOITS06A	FLAGFPSSEQL00	TEST511A2	FLAGFPS02	FLAGFPS03	FLAGFPS04
7100	PSSEQL00	PSSEQL0002	PSSEQL0003	PSSEQL0004	PSSEQL0005	PSSEQL0006	TEST511B2	GOTEST511A2
7110	TEST511A3	GOTEST511A3	TEST511A4	GOTEST511A4	KTSRCOST01	GOTEST511B2	TEST511B3	GOTEST511B3
7120	TEST511B4	GOTEST511B4	SUCBRTEST01	KTSRCOST02	KTSRCOST03	KTSRCOST04	KTSRCOST04B	KTSRCOST07
7130	KTSRCOST08	INITSR537A	SUCBRTEST02	SUCBRTEST03	BR3-537A	SETRESA537A	BUTCOUNT-IS-377	CR3-537A
7140	DR3-537A	AR7-537A	BR7-537A	CR7-537A	DR7-537A	AR11-537A	BR11-537A	CR11-537A
7150	DR11-537A	ER3-537A	FR3-537A	GR3-537A	HR3-537A	AL1-537A	SETUPPSCC#DC	GOTEST551B1
7160	GOBUT621H	SETUPPSCC#DC02	PSCCTOSR3-0	PSCCTOSR3-0AA	PSCCTOSR3-0BB	CLEAR624	EXPEC701A	BUSFCN713A
7170	LOADBA701A	GOTEST701A	LOADIR720A	SETADR721A	SETADR720A	SETJAM720A	BUSFCN720A	BDX12
7200	SETJAM721A	BUSFCN721A	MASK762A	C17X12	BDX05	C17X05	SETPRI762C	PRIO6762A
7210	GETIT762A	EOP005	EOP010	JAMUPP002D	INSERTEOPREVNO	INSERT02	INSERTREVNO	INSERT03
7220	INSERT04	DISPLAY	DISP002	DISP003	DISP004	DISP005	DISP006	CLEAR-I-0-A
7230	CLEAR-I-0-B	CLEARI002	CLEARI004	CLEARI005	D[15-12]	D1512A	D[11-06]	D1106A
7240	D[05-00]	DOSOOA	DZERO	DIOIRB	CLRSERVICETOD	DATISERVICETOD	DATOSERVICETOD	CJESERVICETOD
7250	SERVICETOO	PBATOD	FLAGFPSTOD	PSTOD	OODJAMTOD	CLRJAMTOD	JAMTOD	CUATOD
7260	GETMSKPROCDAT	MSKPROCDAT	CMPPROCDAT	RESETPROCDAT	LOADFPSCC	LOADFPSCC02	SRINTOIR	DINTOIR
7270	DBUFINTOIR	RESETUCONP	SRINTOIRS	DINTOIRS	DBUFINTOIRS	RESETUCONP5	BUTSR3-0	. . . . .
7300	BUTIR15-12	BUTINSTR5	BUTIR11FLTPT3-0	NEXTOO7	BUTIR9-6	BUTMOVDR7IR5-3	BUTINSTR1	BUTBGFPSERV
7310	BUTD[C]C	BUTCOUT7DOUT7	BUTFPS05	BUTDMSMBYTE	BUTGD3-2	BUTSR1-0	BUTBGSERVL	BUTMMASKPS[T]
7320	BUTMNXTOOO	BUTMDOO	BUTMNXTOO1	BUTMPS[N]	BUTMNXTOO2	BUTMFLAG7	BUTMNXTOO3	BUTMEXFLAG1
7330	BUTMNXTOO4	BUTMFLTPTS	BUTMNXTOO5	BUTMEXFLAG2	BUTMNXTOO6	KTSRCOST05	BUTMINITJAM	KTSRCOST06
7340	BUTMNXTOO7	BUTD-IS-ZERO	BUTIR11B	BUTPS15	BUTD[C]A	BUTSERVICE	BUTVECTLOAD	BUTDR6-7L
7350	BUTD[C]B	BUTBAOO	BUTOTHERJAM	DINTOIR350	BUTFPPROC	BUTINTRHIGH	BUTINSTRBRANCH	LOADHI350
7360	BUTPREFETCHJAM	GOFOR410	NEXT721A	EXPEC410A	NEXT720A	NEXT713A	WORD410	BYTESECOND410
7370	SETRESB537A	BUTFPFO	. . . . .	GETPROCDAT	VFYOO6	VFYOO5	BUTERROR7	. . . . .
7400	ZTARGET400	ZTARGET401	ZTARGET402	ZTARGET403	ZTARGET404	ZTARGET405	ZTARGET406	ZTARGET407
7410	ZTARGET410	ZTARGET411	ZTARGET412	ZTARGET413	ZTARGET414	ZTARGET415	ZTARGET416	ZTARGET417
7420	ZTARGET420	ZTARGET421	ZTARGET422	ZTARGET423	ZTARGET424	ZTARGET425	ZTARGET426	ZTARGET427
7430	ZTARGET430	ZTARGET431	ZTARGET432	ZTARGET433	ZTARGET434	ZTARGET435	ZTARGET436	ZTARGET437
7440	ZTARGET440	ZTARGET441	ZTARGET442	ZTARGET443	ZTARGET444	ZTARGET445	ZTARGET446	ZTARGET447
7450	ZTARGET450	ZTARGET451	ZTARGET452	ZTARGET453	ZTARGET454	ZTARGET455	ZTARGET456	ZTARGET457
7460	ZTARGET460	ZTARGET461	ZTARGET462	ZTARGET463	ZTARGET464	ZTARGET465	ZTARGET466	ZTARGET467
7470	ZTARGET470	ZTARGET471	ZTARGET472	ZTARGET473	ZTARGET474	ZTARGET475	ZTARGET476	ZTARGET477
7500	ZTARGET500	ZTARGET501	ZTARGET502	ZTARGET503	ZTARGET504	ZTARGET505	ZTARGET506	ZTARGET507
7510	ZTARGET510	ZTARGET511	ZTARGET512	ZTARGET513	ZTARGET514	ZTARGET515	ZTARGET516	ZTARGET517
7520	ZTARGET520	ZTARGET521	ZTARGET522	ZTARGET523	ZTARGET524	ZTARGET525	ZTARGET526	ZTARGET527
7530	ZTARGET530	ZTARGET531	ZTARGET532	ZTARGET533	ZTARGET534	ZTARGET535	ZTARGET536	ZTARGET537
7540	ZTARGET540	ZTARGET541	ZTARGET542	ZTARGET543	ZTARGET544	ZTARGET545	ZTARGET546	ZTARGET547
7550	ZTARGET550	ZTARGET551	ZTARGET552	ZTARGET553	ZTARGET554	ZTARGET555	ZTARGET556	ZTARGET557
7560	ZTARGET560	ZTARGET561	ZTARGET562	ZTARGET563	ZTARGET564	ZTARGET565	ZTARGET566	ZTARGET567
7570	ZTARGET570	ZTARGET571	ZTARGET572	ZTARGET573	ZTARGET574	ZTARGET575	ZTARGET576	ZTARGET577
7600	ZTARGET600	ZTARGET601	ZTARGET602	ZTARGET603	ZTARGET604	ZTARGET605	ZTARGET606	ZTARGET607
7610	ZTARGET610	ZTARGET611	ZTARGET612	ZTARGET613	ZTARGET614	ZTARGET615	ZTARGET616	ZTARGET617
7620	ZTARGET620	ZTARGET621	ZTARGET622	ZTARGET623	ZTARGET624	ZTARGET625	ZTARGET626	ZTARGET627
7630	ZTARGET630	ZTARGET631	ZTARGET632	ZTARGET633	ZTARGET634	ZTARGET635	ZTARGET636	ZTARGET637

LOCN	----0-----	----1-----	----2-----	----3-----	----4-----	----5-----	----6-----	----7-----
7640	ZTARGET640	ZTARGET641	ZTARGET642	ZTARGET643	ZTARGET644	ZTARGET645	ZTARGET646	ZTARGET647
7650	ZTARGET650	ZTARGET651	ZTARGET652	ZTARGET653	ZTARGET654	ZTARGET655	ZTARGET656	ZTARGET657
7660	ZTARGET660	ZTARGET661	ZTARGET662	ZTARGET663	ZTARGET664	ZTARGET665	ZTARGET666	ZTARGET667
7670	ZTARGET670	ZTARGET671	ZTARGET672	ZTARGET673	ZTARGET674	ZTARGET675	ZTARGET676	ZTARGET677
7700	ZTARGET700	ZTARGET701	ZTARGET702	ZTARGET703	ZTARGET704	ZTARGET705	ZTARGET706	ZTARGET707
7710	ZTARGET710	ZTARGET711	ZTARGET712	ZTARGET713	ZTARGET714	ZTARGET715	ZTARGET716	ZTARGET717
7720	ZTARGET720	ZTARGET721	ZTARGET722	ZTARGET723	ZTARGET724	ZTARGET725	ZTARGET726	ZTARGET727
7730	ZTARGET730	ZTARGET731	ZTARGET732	ZTARGET733	ZTARGET734	ZTARGET735	ZTARGET736	ZTARGET737
7740	ZTARGET740	ZTARGET741	ZTARGET742	ZTARGET743	ZTARGET744	ZTARGET745	ZTARGET746	ZTARGET747
7750	ZTARGET750	ZTARGET751	ZTARGET752	ZTARGET753	ZTARGET754	ZTARGET755	ZTARGET756	ZTARGET757
7760	ZTARGET760	ZTARGET761	ZTARGET762	ZTARGET763	ZTARGET764	ZTARGET765	ZTARGET766	ZTARGET767
7770	ZTARGET770	ZTARGET771	ZTARGET772	ZTARGET773	ZTARGET774	ZTARGET775	ZTARGET776	ZTARGET777

PAGE	---USED--- OCTAL/DEC.	---OPEN--- OCTAL/DEC.
4	773/507	5/ 5
5	774/508	4/ 4
6	772/506	6/ 6
7	775/509	3/ 3
TOTAL	3756/2030	22/ 18